PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

Vol. CIII JULY 30, 1936 No. 5

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PAPER

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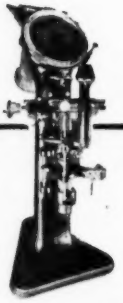

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Backed by 94 Years' Service

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PAPER TRADE JOURNAL

ESTABLISHED 1872

SIXTY-FIFTH YEAR

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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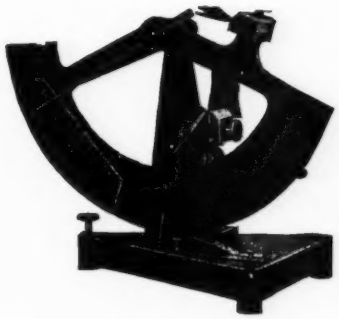
Elmendorf Tearing Tester Reduces Scientific Testing To Simple Routine



The Elmendorf Tester takes all the mystery out of tearing testing. It reduces scientific testing to a matter of simple routine.

The operation of the Elmendorf Tester is based on established scientific principles. The tearing strength of paper is determined by its resistance to the weight of a falling pendulum through a definite arc of travel.

The construction of the Elmendorf Tester is so simple that there isn't anything to get out of order. The results of tests made with the Elmendorf Tester are directly comparable no matter who makes the tests and no matter where the tests are made.

To make a test the pendulum is brought to its upright starting position, the sample of paper is inserted in the two jaws and the tear is started with the knife blade. The pendulum is then released and its fall is retarded by the resistance offered by the strength of the paper. This definite amount of resistance is measured accurately and indicated on the instrument dial.

The Elmendorf Tester is approved by TAPPI

Standardize Your Paper Testing with the Standard Tester of the Paper Industry. 448

THWING-ALBERT INSTRUMENT CO.
3341 Lancaster Ave., Philadelphia, U.S.A.

WHY ADD TO THE PRESENT NUMBER OF INEFFICIENT KRAFT MILLS

It is not necessary to go back 20 to 30 years for a design to serve present and future needs of the pulp and paper industry, yet that is what is being done with some of the latest developments in this country. An ordinary lifetime will not wipe out the harm resulting to the industry and to individuals depending upon it for their living, from poorly designed and out of date mill properties.

In the design and building of modern low cost, up to date mills we should, and we can, lead the world. You can say that it is none of your business what Tom Jones does, but if you are making your living from the industry you have at least the right to speak and to protest against the building of mills of the vintage of 1905.

Swollen operating costs never can be deflated if they arise from incorrect mill design and equipment. The best of management cannot make them pay in competition with the type of mill that is about to become a reality. The mill that is incorrectly conceived can set the industry back many years. Might it not be well, therefore, in all seriousness to check up before spending millions?

Just because the first kraft mill was built around diffusers and small digesters is no valid reason for continuing to build to that design. Why make an additional investment of 25 to 35 per cent just to perpetuate tradition? You are adding to fixed charges as well as to operating expense.

The treatment of pulp and paper has undergone many revolutionary changes within the past few years. Equipment has been newly designed and built, and has received the favorable test of sufficient time to demonstrate its economy and stability.

As an example, the new system of continuous washing is extremely simple, effective, flexible, cheaply operated and maintained. It will save 50 per cent of the chemical losses encountered in washing by the diffuser method. Further, the black liquor from the proposed washers will have a higher density. These reasons alone are enough to recommend the installation, besides which the investment is smaller by 35 per cent.

Remarkable gains over the methods now employed in the dewatering of black liquor can be made, thus saving from three to five million B.T.U. per ton of production in this operation alone. The capital account will receive the credit due to the lower investment.

The multiple effect evaporator is within itself an efficient piece of apparatus. I propose the elimination of the ineffective parts attached to it, substituting improvements that will give to it remarkable performance. This leads to a step nearer the goal of NO PURCHASED FUEL.

All of the existing methods of final dewatering and the formation of granules is accomplished with an even exchange of heat. My plan is to save a large fraction of the heat of exchange. This saving is to be made through the concentration of 60 per cent black liquor to a granule state and the burning of the granules at 98 per cent dry. A procedure of this kind will result in remarkable economies.

Regardless of the tonnage of the mill, two boilers are all that the modern kraft process will require. Therefore the investment in boiler and recovery plant is very much less than in the old type mill. The steam made from the waste material is sufficient in quantity to provide for heat to process and all necessary power for paper and pulp. NO PURCHASED FUEL.

In contemplating the new mill it is well to remember that it is the operating expenses that will remain with you for the life of the plant. Simply astounding savings in investment and operating expenses are available to those building the new type, modern mill of 1936.

Released by V. D. SIMONS
Member, Western Society of Engineers

Industrial Engineer
Tribune Tower
435 North Michigan Avenue
CHICAGO

PAPER TRADE JOURNAL
Reg. U. S. Pat. Off.
PAPER SIXTY-FIFTH YEAR PAPER
Established Feb. 17, 1899 Consolidated Nov. 16, 1899 with PAPER TRADE JOURNAL.
Vol. CIII, No. 5 Thursday, July 30, 1936
Established Sept. 21, 1910 Consolidated Feb. 19, 1925 with PAPER TRADE JOURNAL.

Champion Paper & Fibre Co. Earns $1,207,389

Current Assets Total $11,908,617 Against $7,745,097 of Predecessor Co. Year Ago—Earnings Per Common Share Amounted to $1.69 Instead of the $1.35 Figure Obtained on Basis of the Capitalization at End of Year

[FROM OUR REGULAR CORRESPONDENT]

CINCINNATI, Ohio, July 27, 1936—The report of the Champion Paper and Fibre Company, formerly the Champion Coated Paper Company, and subsidiaries for the fiscal year ended April 26, 1936, certified by independent auditors, shows net profit of $1,207,389, after depreciation, depletion, interest amortization, Federal and state income taxes, etc. Based on capitalization outstanding at close of year, the above net income is equivalent, after allowing for annual dividend requirements on 77,500 shares of 6 per cent preferred stock, to $1.35 a share on 551,000 no-par shares of common stock. No provision was made for Federal surtax on undistributed earnings, inasmuch as the tax is not applicable to fiscal years beginning before January 1, 1936, according to the company.

Logan G. Thomas, president, states that because company's capitalization varied during the year, due to readjustment of capital structure, to avoid distortion of the company's earnings it should be pointed out that on the basis of average preferred and common stocks outstanding, including the now-retired preferred stock of Champion Fibre Company, earnings per common share amounted to $1.69, instead of the $1.35 figure obtained on basis of capitalization at end of year.

Current assets as of April 26, 1936, including $3,612,898 cash and $347,722 in marketable securities, totaled $11,908,617, and current liabilities amounted to $1,841,771. On April 28, 1935 consolidated balance sheet of predecessor company showed $1,111,987 cash, $21,000 in marketable securities, current assets of $7,745,097 and current liabilities of $2,365,134.

The April 26, 1936, current assets included proceeds of sale of 17,500 shares of preferred stock and 78,381 shares of common stock, which are to be used to defray costs of a new pulp mill now under construction at Houston. Around $4,000,000 will be spent on the new mill during present fiscal year. It is expected to be in operation about January 15, next.

Gross sales for the year ended April 26, last, were $19,691,009 against $17,971,928 in previous year.

Earned surplus as of April 26, last, was $6,905,096 as compared with $7,122,004 a year earlier. Total assets were $29,985,916 against $25,028,260.

Manitoba Paper Co. Runs Full

PINE FALLS, Man., July 26, 1936—The Manitoba Paper Company's plant is again operating at full capacity, after a lapse of almost four years. The initial unit of this plant again commenced operation a year ago, and during the past few days the second unit has been again set in motion. The big mill was closed down in 1932 when the Abitibi Power and Paper Company, which was then in liquidation and which owned the property, could no longer continue operations.

With the co-operation of the Manitoba Government, reopening of the plant became a possibility late in 1934, and orders were placed for large quantities of pulpwood, and in July, 1935, production was commenced with a single unit with a daily capacity of approximately 250 tons.

C. C. Irvine, manager of the plant at Pine Falls, states that there is no definite information as to how long the second unit will continue in operation, and it may not be permanently active. The accumulation of orders for immediate delivery, however, had necessitated commencement of production with the second division of the plant. At the present time supplies of pulpwood on hand are adequate for the needs of the plant at full capacity, but if the second unit will continue to operate, additional pulpwood supplies will be required.

Operation of the second unit means an increase in the power consumption of about 80 per cent, or a total of around 45,000 h.p. per day. Power is supplied from the Great Falls power plant of the Manitoba Power Company.

Algonquin Makes Production Record

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., July 27, 1936—Officials of the Algonquin Paper Mill stated this week that a new record was established in producing over 20,000 tons of newsprint during the first half of this year. Orders now on the books insure capacity operations for the remainder of the year. Improvements to the paper machine costing $50,000 last winter increased the capacity of the mill nearly 30 per cent, it was stated, and about 300 men are being employed. A schedule of six days weekly and four shifts of six hours daily is being observed.

Masonite Corp. to Retire 7 Per Cent Preferred

Common Stock Holders, Meeting At Wausau, Wis., Vote to Issue 21,335 Shares of New 5 Per Cent Preferred—New Stock Would Carry Warrants for Conversion Into Common Stock On Basis of Two Shares for One New

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 27, 1936—Holders of common stock of the Masonite Corporation, at a meeting at Wausau, Wis., last week voted to retire the present 7 per cent preferred stock and to issue 21,335 shares of new 5 per cent preferred stock.

Under a plan which must be approved by the federal securities and exchange commission, new preferred stock would carry warrants for conversion into common stock on a basis of two shares for one new share, and old common stock could be exchanged twelve shares for one of new preferred stock.

If the new preferred stock issue is not subscribed by present common stockholders, officials said, preferred stockholders may exchange the stock share for share, plus a payment of $3 per share.

Water Power Assessments

Tolls assessed against water power users of the Wisconsin River by the Wisconsin Valley Improvement Company, Wausau, Wis., total $76,039 for the first six months of 1936. Approval has been asked of the Wisconsin Public Service Commission to make these levies under a charter law which authorizes the company to earn a 7 per cent return.

Individual assessments are as follows:

Wisconsin Public Service Corporation, $12,956.86; Wisconsin Power and Light Company, $11,842; Consolidated Water Power and Paper Company, $14,606; Nekoosa-Edwards Paper Co., $9,964; Rhinelander Paper Company, $2,486; Tomahawk Kraft Paper Co., $4,118; Grandfather Falls Company, $4,433; Wausau Paper Mills Company, $3,653; Marathon Paper Mills Company, $4,067; Mosinee Paper Mills Company, $3,475; Wisconsin River Paper and Pulp Company, $4,231, and Whiting-Plover Paper Company, $208.

Consolidated Re-Elects Directors

Stockholders of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., reelected the incumbent directors at the annual meeting last week. They are George W. Mead, Stanton W. Mead, Walter L. Mead, Theodore W. Brazeau and E. B. Redford. Approximately fifty stockholders were present.

News of the Industry

The Lake States Engineering Company of Chicago, has been awarded the contract for rebuilding the control dam of the Fox River at Menasha, Wis., according to announcement of the War Department. The dam will be of concrete construction, with power-operated steel gates, and will be made larger to serve a flood control system planned for the tributary water sources. The dam will replace an obsolete structure built many years ago. The amount of the contract is $69,187.50.

Paper mills of the Fox River Valley have been requested to assist other shippers in maintaining a freight rate of 75 cents a ton on coal shipped to the valley from Great Lakes ports. The railroads were granted permission March 25, 1933 to lower the rate from 94 cents to 75 cents to meet truck and barge competition. The schedule is due to expire August 1 and the railroads have indicated they would not ask that the lower rate be maintained. The paper mills have been asked to file a motion with the Wisconsin Public Service Commission to extend the expiration date for a further period. Railways named as defendants are the Chicago and Northwestern, the Green Bay and Western, the Chicago, Milwaukee, St. Paul and Pacific, and the Soo Line.

Approximately 1,000 persons attended the annual picnic of the Banta Publishing Company, Menasha, Wis., July 18, at the Menasha City Park. An extensive program of entertainment was conducted for employees and their families.

F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, Wis., has been named to the executive Board of the Northwestern Mutual Life Insurance Company of Milwaukee, Wis. His appointment was made at a meeting of the board of trustees last week, during the sixtieth annual convention of the Association of Agents.

William H. Owen was presented with a gift by the Neenah Paper Company, Neenah, Wis., at a picnic of the employees last week. He has been in the employ of the company for 49 years, and was honored as the oldest employee.

Rudolph E. Lofgren, an accountant for the Kimberly-Clark Corporation, Neenah, Wis., and Miss Vera Sandstrom of Chicago, were married July 18 at the Irving Lutheran Church, Waukegan, Ill. They are spending their honeymoon in Northern Wisconsin and Michigan, and will reside at 115 West Forest avenue, Neenah.

Paper Mills Buy Machinery

Fibre Making Processes Inc., Tribune Tower, Chicago, reports sales during the past few months of the following machinery in which it specializes:

Crown Willamette Paper Company, West Linn, Ore.—two 12 x 45-foot barking drums and one 12 x 22½-foot washing drum.

Ontario Paper Company Ltd., Baie Comeau, Que.—two 12 x 45-foot barking drums.

Champion Paper and Fibre Company, Houston, Texas—six F. M. P. circulating and indirect heating systems and one Nekoosa uniform chip cutter.

St. Regis Paper Company, Deferiet, N. Y.—one F. M. P. circulating system.

Great Northern Paper Company, Madison, Me.—two F. M. P. coarse screens.

Low Water Closes Paper Mills

PHOENIX, N. Y., July 27, 1936—Drastic action was taken this week by state officials in order to maintain navigation in the barge canal. It is claimed that the Oswego River is at its lowest level in half a century and an order was issued closing four paper mills in this city and sharply curtailing the use of water power by mills at Fulton and Baldwinsville. It is estimated that about 200 workers are idle as the result of closing the paper mills here and a fifth mill, equipped with electric power, curtailed production 50 per cent.

Important Paper Groups Convene In Chicago

Executive Committee of Book Paper Manufacturers Association Meets In Drake Hotel July 29—General Meeting Scheduled for July 31—Sulphite Bond Group of Writing Paper Manufacturers Association Holds Sessions

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., July 27, 1936—Chicago is to be the host city to a number of important paper meetings this week. All are scheduled at the Drake Hotel beginning with a session of the executive committee of the Book Paper Manufacturers Association the morning of July 29. The Sulphite Bond members of the Executive Committee of the Writing Paper Manufacturers Association meets at the Drake the same afternoon, while the general meeting of the Book Paper Manufacturers Association is slated for the next morning at 10. The Sulphite Bond Group of the Writing Paper Manufacturers Association meets at 2:30 in the afternoon of July 30. On July 31 the general meeting of the Book Paper Manufacturers Association will be held at the Drake. Advance indications are that all meetings will be well attended.

Paper Market Conditions

Cooler weather and nearness to the Fall season have helped to stimulate the Chicago markets during the week. No pronounced improvement is noted in any particular line although the undertone is reported as highly satisfactory. Mixed conditions continue to prevail although the kraft market retains its position as a leader. Book paper gave a better account of itself during the week with local representatives of mills reporting better production. Covers also shared in the better tone. Reports indicated less strength in the lower grades of sulphite bonds, although the better grades and the remainder of the fine paper list came through the week in improved position. Groundwoods were comparatively dull, showing a slightly disappointing record. Newsprint remained virtually unchanged. The board market was quoted as being in fair shape. Waste papers improved slightly with a better tone in evidence in the higher grades.

News of the Industry

It is reported that a Chicago syndicate is interested in the renovation of the old Tomahawk Pulp and Paper Company mill at Tomahawk. Wis. The Chicago group, headed by P. J. Schrader, who arranged the details, is reported to have arranged to take over the assets and properties of the company and plans to rehabilitate the mills and operate them. Permanent plans are not as yet completed. The mills, not to be confused with those of the Tomahawk Kraft Paper Company of the same city, have been idle for some time. A number of years ago Tomahawk was a substantial producer of ground wood papers.

The Allis-Chalmers Manufacturing Company, of the neighboring city of Milwaukee, has recently issued an informative booklet, No. 2224, describing and illustrating the single section and inlet centrifugal pumps used with either the Texrope V-belt or direct connected drive. The booklet contains a number of dimension tables and full information concerning actual installations which are certain to be of interest to the paper manufacturing industry.

A general data book, designed to give information concerning the handling of special steels, has been prepared by the Joseph T. Ryerson Company of Chicago. The 192 page document condenses a lot of practical information and applications into a most educational digest on an important matter.

The Robinson-Patman Act serves as the chief source of discussion for the Chicago paper industry. The relationship of the act to f.o.b. shipments; to what constitutes "discrimination in price" and to the establishment of prices on various grades has the industry pretty well up in the air. The consensus of opinion among the various Illinois associations is that merchants doing an honest business in a way which has been satisfactory to themselves should go ahead and not worry too much about the provision of the bill. Confusing as it is, it will be many months before the effects of the act are interpreted. In the meantime, local comment indicates that the burden of the proof—at least the initial gesture of enforcement—should come from the Federal Trade Commission itself.

The Salesmen's Association of the Paper Industry, Midwest Division, met at the Hotel LaSalle on Monday, July 20, with a large attendance and with the discussion centering on various market reports and on the third of the monthly golf outings to be held at Knollwood on July 24. Chairman Burt Fisher reports an unusually large amount of advance reservations for the one day golf outing and anticipates a record crowd.

Some indication of the seriousness of the flood effects on the paper industry is reflected in the current report of the Whitaker Paper Company which shows a net loss, for the first six months ended June 30, totaling $6,416, after write-down of $148,439 for flood losses. This is comparable to a profit of $141,045, before federal taxes, in a like period last year. The flood write-down marks the difference.

Low Cost Centrifugal Acid Pump

A small, low cost, centrifugal pump made of Worthite, an acid resistant nickel-chromium-molybdenum steel, is announced by Worthington Pump and Machinery Corporation of Harrison, N. J.

The manufacturer states that this inexpensive, high quality pump is made possible through simplification of design and quantity production. All parts of the liquid end of this pump are of Worthite. Acid resistance of other parts is obtained by using specially treated steel, coated with chlorinated rubber.

The impeller is of the open type, with three vanes opening down to the hub. This construction subjects the stuffing box to suction pressure only. The shaft is one solid piece of Worthite, with impeller attached by lock nuts and key to prevent it from working loose if the motor is started in the wrong direction. The casing is of the full volute type, specially designed to secure non-porous high-alloy steel castings.

This pump is particularly well adapted to handling most acids and alkalies where medium-pressure, transfer pumping is required. Heads available to 70 feet, and capacities to 130 gallons per minute.

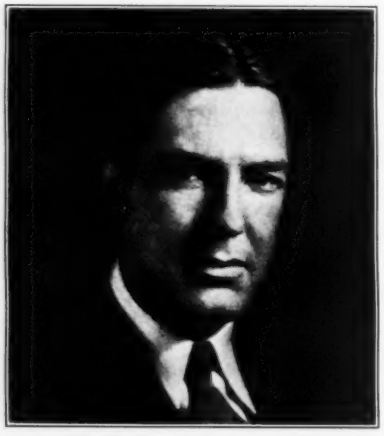
A descriptive bulletin, W-350-B1 showing cross sectional views and rating charts will be furnished on request.

Poore Made Treasurer of John Carter & Co.

Succeeds the Late Arthur C. Hall, Treasurer and General Manager, Who Died Last November—Mr. Poore Became Sales Manager of the Company In January, 1930—Was Formerly Treasurer of the Stone & Andrew Co.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., July 27, 1936—At the annual meeting of John Carter & Co., Inc., held on July 21, Leon M. Poore was elected treasurer of the corporation. Mr. Poore succeeds the late Arthur C. Hall, treasurer and general manager, whose death occurred November 12 last. Mr. Poore became sales manager in January, 1930, having previously



LEON M. POORE

been treasurer and manager of Stone and Andrew Company. His home is at Haverhill, Mass.

Paper Demand Fairly Active

The summer continues with the decline in the paper market generally less marked than usual, as was expected. The last week showed a fair volume of sales on the whole, in both fine and wrapping paper. A dealer in fine paper intimated that the month with his house had been better than the previous one. At the New England office of a company manufacturing fine paper, it was stated that the week was a little better than the one before.

Favorable Reports in Kraft Market

Fairly favorable reports were heard in the kraft market. A member of a firm handling wrapping paper noted that business was "pretty good, no complaint." Another made the comment, "fairly busy." Prices of blotting paper have been marked up a half-cent by practically all the manufacturers, if not all. The demand for blotting paper, however, is reported as poor.

Good Tonnage of Tissue Sold

A good tonnage of tissue paper was sold, but the price situation in this commodity is apparently demoralized, with competitive conditions still "terrible," according to a statement made at the local office of a manufacturer. Now that the paper box factories have resumed operations, interest in box boards is "showing a little more life."

Paper Stock Quiet

Paper stock was quiet, although prices throughout the list did not suffer any decline. In old papers, the prices of mixed papers and old newspaper remained firm at $6 per ton, f.o.b. Boston. Both of the large users of old newspapers are now paying this figure. There was no particular feature in bagging, new domestic rags, old domestic rags or foreign rags.

Twine business was fair. Cotton twine prices are advancing, due to the rise in raw cotton.

News of the Industry

William J. Vincent, superintendent of the paper box department of the William Carter Company, Needham Heights, Mass., is at Brewster, Mass., on Cape Cod, with his family, for a two weeks' vacation.

A. L. Salzer, of S. Schapiro & Sons, paper stock dealers, Baltimore, Md., called on the trade last Tuesday.

Arthur M. Burr, New England representative of the Cayuga Linen and Cotton Mills, Auburn, N. Y., is passing a two weeks' vacation at Nantucket.

Ernest S. Reid, manufacturers' representative, has gone to Harwichport, Mass., on Cape Cod, for a week's vacation.

Warren D. Thompson, salesman for Baird & Bartlett Company, box board dealers, is passing a two weeks' vacation at Waterford, Me., where his wife and family are spending the summer.

Mengel Co. To Start Plant at New Brunswick

[FROM OUR REGULAR CORRESPONDENT]

NEW BRUNSWICK, N. J., July 27, 1936—One of the city's newest industries will begin operations September 1 when renovations are expected to be completed to the plant on Quentin avenue, formerly owned by the Cadgene Piece Dye Works, Inc., and recently purchased by the Mengel Company of Louisville, Ky., for the manufacture of corrugated paper shipping boxes.

The local plant, selected by the Louisville firm for its eastern branch because of its close proximity to New York and Philadelphia, will be used to supply the company's customers of this vicinity formerly handled by the main factory in Kentucky. Renovations to the Quentin avenue property include general repairs and adapting the building to box manufacturing. Approximately 40 persons will be employed when the factory opens for business next month.

R. Wells Covington Jr., who has been the eastern representative for the Mengel Company for the past seven years, will be resident manager of the New Brunswick plant. Harry E. Miles, assistant sales manager, will move to New Brunswick from Winston-Salem, N. C., and will direct the operations of both divisions. L. L. Anderson Jr., of the sales department at Louisville, Ky., will also move to this city.

Plans of the company, according to officials interviewed in Louisville recently, are to expand the New Brunswick plant later if their business grows. The main plant in Louisville operates with 150 employes, while the branch in Winston-Salem employs about 100 persons.

The company began producing corrugated paper boxes in 1911 and was the first manufacturer to make them of southern-made pine wood paper. The material for the boxes to be produced here will be shipped from paper mills in the Southern states.

Court Accepts Bid for Reading Paper Mills

Private Offer by W. G. Shortess of $85,000 for Property Accepted—Includes All of Paper Mill's Assets Except Two Classifications—Group Which Bid for Property at Public Auction Last Month Will Appeal Sale Order

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., July 27, 1936—Sale of the Reading Paper Mills, Reading, Pa., to W. G. Shortess, of Bogota, N. J., was authorized on July 23 by Federal Judge William H. Kirkpatrick. The court ordered acceptance of Mr. Shortess' private bid of $85,000 for the property, which includes all of the paper mill's assets except two classifications.

James A. Keough, counsel for a group which bid for the property at public auction last month, informed Judge Kirkpatrick his clients will appeal the sale order.

Judge Kirkpatrick said Mr. Keough's clients must post $40,000 appeal bond to assure the mill's creditors that the ultimate sale would yield as much as Mr. Shortess' bid. Mr. Keough said later he would ask the court to reduce the bond requirements.

The classifications excepted from the sale were water rights in the Tulpehocken Dam—for which the Reading Company and the Reading Iron Company have paid $6,000 for a perpetual easement—and accounts receivable, which already have netted the receivers $35,000.

When the public auction was held last month, the property was bid in for $53,500, but neither the Packerack property—the largest mill—nor the water rights were included.

Judge Kirkpatrick refused to accept Mr. Keough's contention that addition of the Packerack Company would bring the total of the public auction bids to more than Mr. Shortess' offer.

Outlook for Paper Industry Favorable

In spite of all the extraneous matters that have entered into the picture here, the tangible factors in the business outlook of the paper trade continues favorable, and it is reported from reliable sources to be at the highest level since 1930 and summer dullness has been far less pronounced than usual. While collections have fallen off a bit as a result of the advent of the active vacation season, they are much better than at this time last year.

From an executive in a very large paper house comes the statement that business is fairly good thus far, being 10 per cent ahead of this same period last year on all their diversified lines. An executive from another equally large paper house reports that business could be better.

Some slight stimulus was experienced in the waste paper industry this past week. A betterment in demand for stock with prospects good for a slight rise in the lower grades is reported by those in the "know" here.

Trenton Container Corp. Formed

E. E. Gaus and R. W. Williams have formed a partnership to be known as the Trenton Container Corporation. Mr. Gaus, familiarly known as "Bud," was connected with the Container Corporation of America for sixteen years during which time he was plant superintendent. Mr. Williams, also in the employ of the Container Corporation of America for eighteen years, was connected with the sales department. They have leased the building at 1 Johnston avenue, Trenton, N. J., where they will manufacture corrugated boxes and will be known as the sheet stock plant. They expect to start operations by August 15 and will employ upwards of two hundred people.

Norton W. Walker Dead

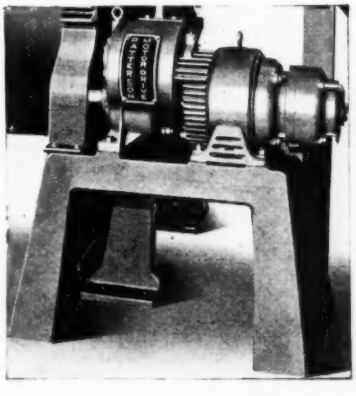
The many friends in the paper trade here were shocked to learn of the death of Norton W. Walker, who rendered such valuable service to the industry as executive secretary for the Philadelphia Trading Area of the Code Authority. Mr. Walker died suddenly in New York on Tuesday of last week. At the time of his death he was representing a New York jobber on Scott paper products. Mr. Walker was a graduate of Cornell, and before his appointment as executive secretary for the Philadelphia Trading Area of the Code Authority, was connected with an office supply and filing system establishment on Walnut street in Philadelphia. He is survived by his widow, Madeleine and a son who is in his seventh year.

Correction

On page 11 of the July 16 issue of the PAPER TRADE JOURNAL, the name of Harold B. Collins, of the National Waterproofing Company, appeared in a list of members of the Philadelphia Paper and Cordage Association.

Mr. Collins writes that he has not been connected with the National Waterproofing Company since October, 1935, and therefore his name was quoted in error.

New Pebble Mill Motor Drive



The Patterson Foundry and Machine Company of East Liverpool, Ohio, has just placed on the market a new motor drive for pebble, ball and tube mills, tumbling barrels, rotary mixers, etc.

This new drive is of the built-in motor type with helical gears in the reducing unit. It has a magnetic brake built into it so that when the stop button is pushed, the mill or cylinder stops immediately, and by pressing the inching button, the Mill can be inched over into exact position for discharging and for reloading.

The drive is built in all sizes from 1 to 100 h.p.

Canton Government Paper Mill To Start

WASHINGTON, D. C., July 27, 1936—It is understood that the Canton government paper mill will begin operations early next year with the manufacture of newsprint paper according to a report to the Department of Commerce from Consul Howard Donovan at Hong Kong. Later other kinds of paper will be produced. Pine trees will be used as a basic raw material.

TAPPI to Visit Canadian Mills*

By J. N. Stephenson[1]

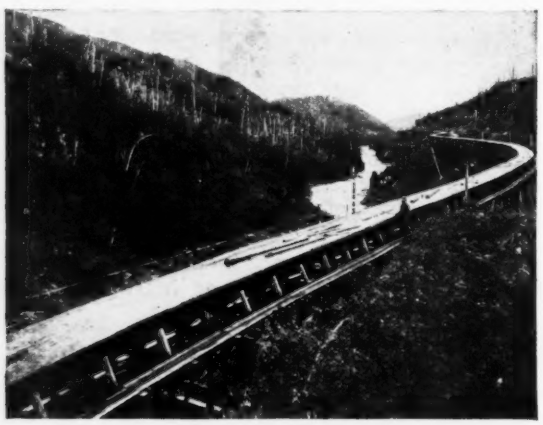
From the wharf at Bagotville, we can see the Port Alfred docks of Saguenay Terminals Limited on the other side of Ha Ha Bay, where we may see a ship unloading cryolite from Iceland, bauxite from British Guiana, and sulphur, coke or coal from almost any ocean or lake port. These raw materials are used in large quantities by the aluminum and paper companies of the Saguenay district. There are also likely to be a ship or two loading newsprint made at Port Alfred, or one of the Price Brothers mills or aluminum ingot made at Arvida, for customers overseas. The reason for the great industrial development in this area is the amount of cheap hydro-electric power, and the availability of raw materials. In the 26 miles from Lake St. John to the foot of the Chute à Caron there is a fall of 300 feet, equivalent to 1,500,000 h.p. of which 750,000 h.p. have been developed. The immense volume of water stored in Lake St. John provides a steady flow. The Quebec Government has also built storage dams on smaller, contributary rivers, and several of these—Shipsaw, au Sable, Chicoutimi—generate considerable power, while other and large powers await development. For amusement the visitors can try twisting their tongues around the names of some of the rivers and lakes of this district, such as: Ouiatchouan, Ticouapé, Pamouscachiou, Metabetchouan, Mistassini, Ashuapmouchouan, and even Chicoutimi.

Nothing daunts a Canuck when he sets out to do something. The committee are not exactly Canucks, but they have that trait of persistence. There are three features at the head of the Saguenay that *have* to be seen: the Minton vacuum drier newsprint machines at Riverbend; the power plant at Isle Maligne; and the aluminum works at Arvida. With a man who has had years of experience organizing tours, Leo Tobin, sitting in with the committee, a plan was evolved. The men folks will rise early (as usual) and board a special train that will back down to the wharf and start for Riverbend, fifty miles away, in a Canadian National train over the Aluminum Company's Roberval and Saguenay Railway. Here the newest mill of Price Bros. & Co. Ltd. will be visited, after which the party will go to Isle Maligne to inspect the hydro-electric plant of the Saguenay (formerly Duke-Price) Power Company. It is more probable that two groups will be formed so as to avoid congestion and give more freedom of movement.

As this is a self-contained expedition, the Commissariat will have food, etc., on the train and lunch will be eaten during the thirty-mile trip back to Arvida. Here we see not only one of the world's largest electro-chemical industries, but also a model industrial town. It is expected that the train will arrive back at Bagotville with time for a brief visit to the Port Alfred Division of Consolidated Paper Corp.

[1] Editor, Pulp & Paper Magazine of Canada.

* This is the fourth and final installment of a series of articles describing the trip to be taken at the Joint Summer International Meeting of the Technical Association of the Pulp and Paper Industry and the Technical Section of the Canadian Pulp and Paper Association.



THE FLUME THAT BRINGS PULPWOOD 11 MILES TO THE MILL OF PRICE BROS. & CO., AT KENOGAMI.

Price Bros. & Co. Ltd.

As mentioned in a previous chapter, William Price first came to Canada as a representative of the British Admiralty in 1810. His exploration in the Saguenay country so impressed him that he returned to Canada in 1817. A fact of special interest to technical men is that it was James McGill, founder of McGill University, with whom he associated himself. He then bought land on the St. Margaret River, and began lumbering in a modest way, later purchasing a small sawmill and laying the foundation for a business that has become almost synonymous with Canada. The tradition of service to his people that makes the memory of William Price revered in the Saguenay has been a major life motive to his children unto the fourth generation. In the past hundred and nineteen years the Price domain has grown to 8,565 square miles, owned or leased, and includes many valuable water powers. (The area of Massachusetts is 8,315 square miles.)

The late (Second) Sir William Price succeeded his uncle, John Price, as head of the business in 1899. In 1902, Price Brothers entered the paper business with a paper and board mill at Jonquière. This mill makes a variety of colored poster, special papers, and boards. Ten years later, the newsprint mill was built at Kenogami, where the company also established a town on an ideal site. This was the first mill in Canada to install continuous type magazine grinders, and one of the first in the world to produce over 500 tons of paper in one day.

The Riverbend mill, which the convention will visit, is located on the Little Discharge of Lake St. John. At this point there is a fine booming ground (meaning water) for pulpwood logs. Here, on a bluff (meaning a plateau overlooking river and neighborhood) the company has built an efficient mill and an attractive town with all modern conveniences and essential services.

This mill has twenty continuous magazine grinders, on some of which the interesting experiment was successfully accomplished of setting in a section that widened the magazine from 39 to 53 inches. There are five digesters. The wood for both pulp mills is prepared down by the river, and the clean bolts and chips are brought up by conveyors. In the machine room are four 234 inch Fourdriniers. Two of these are the first newsprint machines built with Minton vacuum driers; they were ordered as a result of the extensive research conducted on a converted machine at the Kenogami mill. S. J. Fisher, general superintendent, and his staff will be glad to show the visitors the excellent printing results obtained with paper

made on these machines. The staff house, hospital, and school are important features of Riverbend.

The Isle Maligne Power Plant

The Saguenay Power Company's Isle Maligne plant is one of the largest hydro-electric plants in the world. It contains 11 generating units of 45,000 h.p. each. The generator voltage is stepped up to 110,000, 154,000, and 187,000 volts for transmission to the more distant industries in the district, and the Shipsaw No. 1 plant at Chute à only a few miles away, receives current directly from the generators at 13,200 volts. The head at Isle Maligne is 110 ft. In constructing this huge development, a temporary channel was cut in a way that it could be readily blocked and the water directed back to its main channel to the dam and through the turbines.

It is interesting to note that even this half million h.p. was not sufficient for the anticipated expansion of industry in the district, and the Shipsaw No. 1 plant at Chute à Caron was therefore developed. This plant makes use of a further head of 165 ft. and produces 250,000 h.p. although it utilizes only part of the overflow. There are not many other places in the world where such a tremendous amount of power is available. And it has not all been developed yet! Ultimately, the full head of 210 ft. will be used by the Shipsaw No. 2 development and 1,000,000 h.p. will be produced.

It will be interesting to those who have been thrilled and touched with the simple story of *Maria Chapdelaine* as told by Louis Hemon that *Maria* herself lives on the North Shore of Lake St. John but a few miles from the Isle Maligne power house. The writer met the heroine of the story on a recent trip around Lake St. John, and recalled again the tale of courage, hardship, and devotion that were typical of the settlers in this district.

Making a Metal from a Mineral

A few months ago, you may have thrilled at the radio broadcast of the ceremonies commemorating the golden discovery of the present commercial process for producing aluminum. Charles Martin Hall, a 22-year old Oberlin College lad, made the discovery on February 23, 1886. In those days, aluminum cost about $8.00 a pound, whereas today the cost is about 20 cents a pound. In 1886, the world production of aluminum was 16 tons; the production of aluminum this year will be higher than ever before, and will probably amount to about 300,000 tons.

Few people realize how aluminum serves them so extensively in their everyday lives. They think of it only in terms of saucepans and other kitchen utensils. Actually, it is serving them in many vital ways. For instance, the electricity you are now using is probably coming to you from some remote generating station over high tension aluminum transmission lines. Your automobile probably has many important aluminum parts including pistons, cylinder heads and miscellaneous fittings. The buses, streetcars, trains and, above all, aeroplanes in which you travel, depend extensively on this same metal. Your vacuum cleaner, washing machine, flat irons, and other household appliances have, no doubt, been modernized by the generous use of aluminum. The tube from which you squeeze tooth paste or cosmetic cream is more than likely aluminum. This list could be continued almost indefinitely to include such things as aluminum paint, aluminum foil, aluminum furniture, etc.

The enormous water powers of the upper Saguenay attracted the aluminum industry to that district and Arvida was established in 1925 by the Aluminum Company of Canada Limited. This well-planned community has an ideal situation; it is thoroughly modern; and can boast of having one of the largest aluminum plants in the world. It can draw on more than million horsepower.

Canada not only produces about 10 per cent of the world's supply of aluminum, but converts a considerable amount into sheets, utensils, foils, wire, castings, etc. Either fabricated or in ingot form, it is shipped all over the world.

Ladies and other delegates who may not wish to take the all-day trip to Riverbend and Arvida are invited to visit the Port Alfred mill of Consolidated Paper Corp. and to play over the sporty nine hole course of the Port Alfred Golf Club.

Homeward Bound

Soon after we get seated for our evening meal the *Quebec* will put off from the wharf at Bagotville, and toot a farewell to the people who have contributed to making our visit to the "Kingdom of the Saguenay" so enjoyable. Twilight is slipping into another moonlight night as we float again down the Saguenay with the cliff-bordered banks of the river silhouetted against a starlit sky.

The program of technical papers includes a group of contributions by members of TAPPI. Provision for the discussion of these papers will be a feature of the trip back to Montreal, and will be introduced at the most convenient point during the return trip from Bagotville.

We shall be enjoying the peaceful slumber that comes so easily with the quiet steady motion of this fine steamer as we again pass Cape Eternity out into the broad St. Lawrence and up to Quebec. Here, a brief stop must be made to allow those who must do so to disembark. In a few minutes, however, the ship is again underweigh, and as dawn breaks for the last day of our Convention, our ship is steaming up past Donnacona, where we plainly see the paper mill, and along past Portneuf, LesGrondines, Bastican, and Three Rivers. Here, we get a fine view of the hills that make this one of the most important paper making centers—The St. Maurice Division of the Wayagamack Division of Consolidated Paper Corporation; the Three Rivers mill of Canadian International Paper Company, and the St. Lawrence Paper Mills. These mills have 20 newsprint machines with an aggregate wire width of 3,272 inches, 2 wrapper machines, and 5 kraft paper machines. The rated annual capacity for newsprint is 504,000 tons. We note the three mouths of the St. Maurice River, which gave early explorers the notion that three rivers flowed into the St. Lawrence at this point.

A few miles up this river at Shawinigan Falls and Grandmere are the Belgo and Laurentide Divisions of Consolidated Paper Corporation. A few miles further on we enter Lac St. Pierre, made famous by the "Wreck of the Julie Plante," as described by Dr. William Henry Drummond. At the other end of the lake we pass Sorel where at one time an attempt was made to produce paper pulp from swamp acres or sedge. All along the shores we see the quaint houses in the habitant style and note that some of the buildings have thatched roofs. Passing Verchères, we are reminded of the heroic defence of the Fort by the fourteen-year-old Madeleine de Verchères whose story is an epic of the early history of this section. We are now almost to Montreal and soon passing the oil refineries, shipyards, and grain elevators, then Montreal terraced against Mount Royal, and the view is punctuated, as it were, with the outstanding new buildings that mark the city's more modern development.

Swinging into her berth, the *Quebec* ties up once more at the Canada Steamship Lines' dock and the gang planks are slid out. Farewells are taken of the courteous crew who have done so much to make our trip a pleasant one,

and we are ashore again with time for more visiting or shopping before dinner.

The Pulp and Paper Research Institute, including the Pulp and Paper Division of the Forest Products Laboratories, and the Department of Cellulose Chemistry of McGill University, will be open to welcome visitors, and the Dominion Engineering Company Ltd. have extended cordial invitations to visit their interesting plant where paper machines and other equipment for the industry are manufactured.

And so, like all good things, the summer meeting has come to an end, but it will live for many years as an outstanding event in their experience, in the memories of those who have had the pleasure to attend it.

Indianapolis Demand Improves

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., July 27, 1936—Some improvement in the general paper demand here was noticed during the last week. The improvement was welcome, too, in view of the slump that had attended the hottest weather the state ever had seen. Most local executives believe that the approach of the fall season, coupled with slightly cooler weather, will see a further advance during the coming week, particularly in the fine paper field, which has not been so hot. Last week demand for book, cover, bond and ledgers was only fairly active, but showed a slight increase over the mid-summer level. Prices have been held on an even keel and will go into the fall season in good shape.

Newsprint demand has not been so active during the hot weather, but with a change in seasons, which always means more local advertising, the outlook is very bright. The slump during the summer was not as marked as average. Prices are holding and from all indications there are no marked changes in prospect.

Container demand continues active. From inventories at the mid-year, which are just being released, this is certain to be the best year the business had for a long time. In some instances the factories report an increasing expense account so that net income may not show the percentage increase that production shows, but the situation is reported very satisfactory. Factories dealing with the vegetable and fruit industry of the state suffered somewhat due to dry weather for the vegetables and the fact that extreme zero weather during the winter killed practically all the large peach acreages.

Summer specialties continue in active demand and the call for tissues also is very good. All building papers continue steady with prospects for an excellent fall season.

An indifferent demand was reported in the cotton rag demand here last week.

Envelopes with Diagonal Grain

Recently a news release of the National Bureau of Standards called attention to the desirability of diagonal grain in envelopes intended for heavy duty, that is, envelopes with the grain of the paper running at an angle of about 45 degrees with the folds of the envelopes. In such envelopes, all the folds have practically the same strength instead of two of the folds being much weaker than the other two, which is the case when the grain of the paper is parallel to the side folds. According to further information obtained from envelope manufacturers, the diagonal grain can be obtained in diagonal-seam, side-opening envelopes without extra cost, but not in end-opening envelopes without greatly increased cost because of the excessive waste of paper in cutting the envelope pattern.

M. L. Kemp Joins Hurlbut Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

SOUTH LEE, Mass., July 27, 1936—It was announced here today that Melvin L. Kemp has become associated with the Hurlbut Paper Company in the capacity of superintendent, and is taking over his new duties immediately. Mr. Kemp's many years of experience have been in the manufacture of high grade papers of all kinds, and his numerous friends feel sure of his continued success in his new position.

Starting in with the L. L. Brown Paper Company and later with the No. 2 Agawam Division of the American Writing Paper Company, Mr. Kemp, for the past twenty-one years, has been connected with the Strathmore Paper

M. L. KEMP

Company. In this last position, Mr. Kemp served ten years as Superintendent of the No. 1 Woronoco Mill and eleven years as Technical Advisor for all the Strathmore divisions.

Mr. Kemp's coming to Hurlbut with such an unusual and valuable length of experience, should do much to enhance "The Papermaker Gentleman's" already enviable reputation for high grade papers.

Retires As Head of Terre Haute Paper Co.

TERRE HAUTE, Ind., July 25, 1936—Announcement is made of the retirement of W. G. Clark, who for almost thirty-five years was actively connected with the Terre Haute Paper Company. Although Mr. Clark is retiring as president of the company, he has been elected as chairman of the board of directors.

Mr. Clark began his connection with the Terre Haute Paper Company in 1902 when he became superintendent of the concern. The following year when he was made treasurer of the company, however, he retained his position as superintendent along with his added duties. He was elected vice president in 1913 and his duties in this capacity included charge of the operations of not only the local plants, but also supervision of the plants of the Rockford Paper Mills at Rockford, Ill., and the Auglaize Box Board Company at St. Marys, Ohio. In 1933 he became president of the company and has held that position up until the date of his retirement.

C. D. Altick, of Dayton, Ohio, has been named as the new president of the Terre Haute Paper Company to succeed Mr. Clark.

Obituary

E. C. Woodward

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, July 29, 1936—E. C. Woodward, resident of Middletown for 50 years, and who recently retired as secretary-treasurer of the Wardlow-Thomas Paper Company in that city, died last Thursday at his residence, 301 South Main street, following five months of declining health.

Mr. Woodward was widely known in the paper trade not only in the Miami Valley but througout the country. He was a director of the Raymond Bag Company, in addition to holding the official position with the Wardlow-Thomas Company and likewise was interested in the firm affiliated with the bag concern.

Mr. Woodward's father was a power in Miami Valley politics, having been associated with such men as Thomas Corwin, Governor J. B. Foraker and L. B. Campbell, Hamilton, who was congressman for 30 years, from this district.

E. C. Woodward was first employed by a banking firm in Lebanon and went to Middletown in his early youth as an employee of the former First National Bank; a few years later he was employed in a clerical capacity with the former Wilson-McCally Paper Company, and later became identified with the Wardlow-Thomas Paper Company.

He remained with the latter firm in an official capacity until a few months ago when declining health forced him to retire.

He was a member of the Board of Education of Middletown and was an active member of the First Presbyterian Church, Woodward was a first cousin of the late Governor James E. Campbell of Ohio, and was the son of Samuel and Mary Woodward whose lives were written indelibly in the history of the Miami Valley.

Surviving him are his widow, Carrie; one daughter, Mrs. Harriet Philbin, of Long Island, N. Y.; a son, Thomas, of Coral Gables, Fla.; three sisters and several nephews.

The funeral held in Middletown was largely attended by Middletown and Miami Valley men.

Herbert S. McNeely

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., July 27, 1936—Herbert S. McNeely, aged sixty-three, 5008 North Pennsylvania street, lifelong resident of Indianapolis, died today in his home.

Mr. McNeely was traffic manager of the Inland Container Corporation. Born in Indianapolis, he attended public schools here and entered railroad work at an early age.

He was agent for the old C. I. & W. Railroad, which is now part of the Baltimore & Ohio. He subsequently served as chief of the traffic bureau of the public service commission, later going to the Inland Container Corporation.

Mr. McNeely married Miss May M. Potts, in 1894, who survives with a daughter, Mrs. Floyd Church, and a granddaughter, Annabelle, and a brother Harry B. McNeely, of the transfer department of the Chamber of Commerce.

George W. Tripp

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., July 27, 1936—George W. Tripp, 59 years old, prominently identified with the paper mill supply business, died suddenly this week at his summer home near here. He had traveled extensively as a representative of firms dealing in mill supplies.

For several years he was associated with the paper supply business of Myron E. Avery and traveled through Northern New York. After leaving that concern he went with the Albany Felt Company and covered territory extending in the east from Maine to Virginia and as far west as Sandusky, Ohio.

In 1923 he became associated with Brainard H. Treadwell in the mill supply business of the Treadwell Supply Company, Inc., and since then has been secretary and treasurer. For a number of years he directed the sales of the company and also travelled. For a number of years he was also identified with the Brownville mill of the Harmon Paper Company.

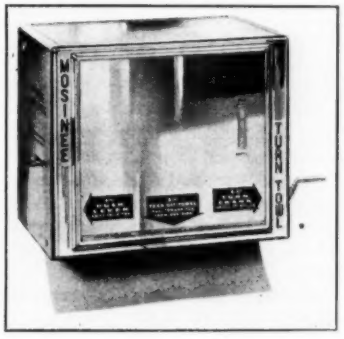
His wife and three children are the principal survivors.

William H. Birdsall

William H. Birdsall, formerly superintendent at the plant of the Keystone Folding Box Company, Newark, N. J., died at his home at Madison, N. J., July 18, following an extended illness. He resigned his position with the Keystone company about a year ago, after a connection of 45 years, with that organization, which removed from Madison to Newark a number of years ago.

Turn-Towl Cabinet

Designed to cut washroom expense, a new paper towel and cabinet have been developed by Bay West Paper Company, Green Bay, Wis., which dispenses paper from a continuous roll. A stop-waste cut-off forces the user to take only one towel at a time. The device is based on tests which showed that making it harder for the user to obtain a towel cuts towel consumption, as compared with use of the ordinary types of folded paper towels.



With "Mosinee Turn-Towls" the user must first push a lever on one side of the cabinet, then turn a hand crank on the other side until it stops, and last, tear off the towel against a cutter-edge.

A roll of non-perforated sulphate kraft paper is held in the cabinet. Paper is fed between rollers, a small roller providing tension against a large roller to which the hand crank is attached. The roll is supported in the cabinet by an ingenuous arrangement, one side of the roll having a metal core-end which makes filling easy and assures the roll being placed in the cabinet properly. The other side of the roll is held by a bracket which slides to permit easy insertion of a new towel roll.

The cabinet is of all-metal construction with a mirror front. It opens outward, and when closed is locked against tampering. In operation, the hand crank turns two revolutions to deliver 10¾ inches of paper. Tearing off the paper trips an automatic release which again sets the machine for operation. A panel on the face of the cabinet indicates continuously the amount of towel material available.

Tests have shown that in addition to the tear-off features, "Turn-Towls" themselves help to prevent waste because of the strength and speed of absorbency of the heavy, yet soft, sulphate kraft material.

Netherland India Buying More Overissue Newspapers from the United States

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 29—United States participation in Netherland India's import trade in overissue newspapers registered notable improvement in the first quarter of the current year while the share of Great Britain sharply declined, according to a report to the Commerce Department from its Batavia office.

Imports of overissue newspapers into Netherland India in the first three months of 1936 totaled 8,486 metric tons compared with 7,944 tons in the preceding quarter and 6,370 tons in the first quarter of 1935. Arrivals from the United States totaled 5,996 tons in the 1936 period compared with 4,177 tons in the last quarter of 1935 and 3,300 tons in the first three months of that year, statistics show.

The proportion of total imports of overissue newspaper imported into Netherland India in the first quarter of this year from the United States was 70.5 per cent compared with 52.5 per cent in the preceding quarter and 52 per cent in the first quarter of 1935. Imports from Great Britain, totaling 2,396 tons in the first quarter of this year, represented 20.5 per cent of total imports, a ratio which compares with 36 per cent in the preceding quarter and 38 per cent in the first quarter of 1935, according to the report.

The gain in imports from the United States, the report states, is ascribed by local importers to an improvement in the quality of the shipments and to the lower American prices prevailing at the end of the preceding quarter.

Mersey Paper Co.'s Profits Up

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 27, 1936—The annual report of the Mersey Paper Company for the past year shows that gross profits increased from $652,502 in the previous year to $764,624. Interest on funded debt and other loans amounted to $391,536, which was covered 1.9 times over. This left a balance of $355,089 which was credited to depreciation and depreciation reserve and now amounts to $2,300,892.

The balance sheet shows total assets up $27,508 at $14,894,289. Among the current assets which aggregated $1,817,882, cash is down about $38,000 to $8,129; receivables on the other hand are up $150,000 at $1,465,540 and inventories dropped to $663,222 from $890,929. Current assets at the end of 1934 were $1,634,507. Investments are off $163,000 to $6,339. Fixed assets are $17,000 higher at $13,064,283.

Price Bros. Reorganization

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 27, 1936—The departure for England of a representative of Kileat and Aiken, a London financial firm which has been a principal in negotiations for the reorganization of Price Bros. & Co., has been followed by a report that he has left with the problem practically settled. This view, while lacking authoritative information, is held to have some support because of the failure of Pacona, Ltd., to submit another offer for the company as was officially stated they would. Meanwhile a rise in the stock of Consolidated Paper Corporation and in the common stock of Price Brothers is seen in some quarters as lending color to the report that a merger between these two leading Quebec newsprint producers is under negotiation. A necessary preliminary to this would, of course, be the lifting of the receivership from Price Brothers.

Southern Kraft to Recapitalize

The directors of the Southern Kraft Corporation, a subsidiary of the International Paper Company, on Tuesday approved plans for a recapitalization of the company, preliminary to its first public financing.

The new capital structure will consist of $14,500,000 of first leasehold and general mortgage bonds, 4¼ per cent Series, due 1946, expected to be offered publicly this week; $14,000,000 of income notes, due 1947; 100,000 shares of no par value common stock with a stated value of $7,000,000; and a non-interest-bearing note of $179,861, secured by a purchase money mortgage, due serially from May 1, 1934 to November 1, 1942.

Heretofore financed mainly by the International Paper Company, the Southern Kraft Corporation has had no securities outstanding with the public. Sale of its $14,500,000 first leasehold and general mortgage bonds will provide funds for pre-payment of $1,582,759 of bank loans, for the acquisition from International Paper Company of $1,619,000 the Louisiana Pulp and Paper Company first mortgage 7 per cent bonds, for the redemption of $292,700, the Bastrop Pulp and Paper Company first mortgage bonds, and for the retirement of bonds and notes of the company owned by the International Paper Company. The remaining indebtedness to the International Paper Company, estimated at approximately $22,763,582, will be met by the issuance to the parent company of $14,000,000 of income notes, due 1947, and 59,900 additional shares of common stock at a stated value of $5,999,000 and the balance of approximately $2,764,582 will become paid-in surplus of the company.

The income notes will be unsecured and will bear interest at the rate of 6 per cent a year, payable only out of income after depreciation and after deduction of interest charges on the new bonds, any deficiency in any year to be cumulative and paid in subsequent years to the extent earned after such deductions. All accumulated and unpaid interest will be payable at maturity.

All of the 100,000 outstanding common shares of the company will be owned by the International Paper Company.

Essex Paper Box Co. Buys Plant

NEWARK, N. J., July 27, 1936—The former John Reilly Leather Company plant at 40 Avenue C and Astor street, vacated and dismantled a number of years ago when the concern was dissolved, has been purchased by John Lumbaise, operator of the Essex Paper Box Company, now at 67 Gobel street.

The property, comprising besides the buildings about five and a half acres of land, was sold by the Fidelity-Union & Trust Co.

The paper box concern has been in business eleven years. It is understood Mr. Lumbaise contemplates building of a modern factory on the premises in addition to renovation of the existing construction.

German Pulp Drier for Western Mill

A press dispatch from Boston, Mass., under date of July 25 says:—"Clamped to the Army Base dock by two flat cars loaded with rails, steam derrick and 25 men swung the world's largest pulp dryer from ship to shore without a mishap.

"Weighing 33 tons, the drier was lifted from the 45-foot deep hold of the German freighter S.S. Frankfurt and placed on a solid steel car. The drier will be shipped to a Western paper manufacturer by a special route to avoid tunnels and close-clearance bridges."

Pronouncement on Walsh-Healey Law

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 29, 1936—Secretary of Labor Perkins has made her first pronouncement in connection with the administration of the Walsh-Healey government contract law, effective September 28. The administration of this act comes under the Department of Labor.

At the same time the National Association of Manufacturers made public an interesting study on this law in which it set forth that the act "may be applied only within narrow limits." The association also set forth various opinions written on the eight-hour law some years ago and its effect on government contracts. One of these was written by Felix Frankfurter for the Secretary of War in 1917 in which he analyzed a 1912 law which sought to impose an eight-hour day on government contractors.

According to the association it was found in connection with the eight-hour day law that paper and paper boxes and a number of other products were exempted from the eight-hour provisions. The association's bulletin dealt particularly with interpretations of the phrase exempting things which "may usually be bought on the open market."

In her first official statement on this subject Miss Perkins said that "shortly before September 28 the Department of Labor will promulgate regulations in the draft of which the principal contracting agencies of the government will participate. These regulations will provide uniform procedure so that there will be no delay in the normal procurement activities of other government departments but will enable the contracting officer and prospective contractors to know in advance their respective obligations under the act. The prevailing wage provisions will not produce delay since no wage stipulation is required until the applicable minimum wages have been ascertained by the Secretary of Labor for a given industry or group of industries. Until this factor has been determined and furnished to the various departments it will not be necessary for the contracting officer to consider this phase of the act."

Miss Perkins said further that "for the purpose of carrying out the act—setting the minimum wage—making rules and regulations for the application and exemption of the other sections and providing for variations over exemptions—the Secretary of Labor will establish a board to act on all the quasi judicial matters and regulatory matters. This board will hold hearings and adopt rules and regulations for the limitation and conduct of its own functions. The studies, investigations and exemptions necessary for the information of the board before action will be made by the regular existing divisions of the department where possible and presented to the board with recommendations by the Chief Examiner, who will be the principal administrative officer."

Bathurst's Business Expands

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 27, 1936—The business of the Bathurst Power and Paper Company for the first half of this year has shown considerable expansion over that of the similar period of last year, according to officials of the company.

The benefit has come mainly from creating finished product outlets for unbleached sulphite pulp. The beginning was made by converting an idle newsprint machine into the manufacture of kraft liner board.

The company has now rehabilitated a 100-ton cylinder machine for the making of folding box board. The operating of this machine will ultimately take care of the company's entire output of unbleached sulphite pulp, from the sale of which the company was realizing little or no profit.

Wallpaper Prices Advance

The wallpaper exposition opened on Monday of this week at the Waldorf-Astoria Hotel in New York. In previous years the Wall Paper Institute, sponsoring the annual exhibit, confined it to the trade, but this year the show was thrown open to the public as the first step of a promotional campaign to attract consumer interest and expand the market.

Sales have risen 50 per cent since 1933, W. L. Carver, secretary of the institute, said, and only through this increase in volume has the industry been able to maintain quotations unchanged. Price advances by paper mills, which supply the bulk of the hanging stock used by the industry, and by manufacturers of other supplies, plus the cost of the Social Security Law, estimated at about 75 cents 100 rolls and up, will force wallpaper producers to increase their quotations, he said.

Among the thirty-five exhibitors at the convention were producers of paper stock, machinery, pigment and colors and other accessories and supplies. Some 10,000 designs were shown by the various wallpaper companies both in the ballroom exhibits for the public and in private rooms for the trade.

Prevailing characteristics of wallpaper design include lighter and more delicately tinted backgrounds, a wide range of color hues and large color masses in broad patterns. Two recently perfected methods for making wall paper washable and non-fading were said to be responsible for these developments. Designers have ventured with white or delicately tinted papers, because of the new washability factor.

Among the modern designs was one consisting of huge morning glories in pastel tones, with a background of pure white. Typical of period styles in modern treatment was a Gainsborough pattern, eighteenth-century Georgian English style, with chalk white on powder blue. Nursery papers featured yellow backgrounds. Circus figures, zoo creatures and fairyland themes were represented in bright colors. Marine motifs, with yachts predominating, were numerous among the novelties. Ship models, racing shells and naval themes also were shown. A feature of the exhibit was an exhibition of children's designs sent in by children to a magazine.

The Wall Paper Institute has its own exposition, described as "Backgrounds of 1936" and consisting of panels of wall paper especially selected from the current offerings of member manufacturers. Pictures of the "Home of 1936," now on exhibition at the Steel Pier, Atlantic City, were included in the institute's booth.

Among other exhibits were walls with automatically changing panels, an art gallery composed of framed pictures cut from wall paper and a Federal Housing Administration exhibition.

Some 1,500 buyers are expected to register before the convention, which continues this week, is over, Mr. Carver said. Advance registrations were 10 per cent greater than a year ago. He added that the industry is employing several hundred more craftsmen than in 1929. Lewis H. Chase, president of the institute, officially opened the expostion to the public.

Drawback on Stencil Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 29—The Treasury Department has announced the allowance of drawback on unfinished stencil paper manufactured by Remington Rand, Inc., Buffalo, N. Y., at its factory at Bridgeport, Conn., with the use of imported tissue paper, by the processes of cutting to size and perforating.

1936 Expected to Show the Greatest Physical Volume of Trade Since 1929

Only extraneous influences, outside the normal operation of business processes, can prevent 1936 showing the greatest physical volume of trade since 1929, in the opinion of the United States Chamber of Commerce in a review of general conditions made available early this week.

With the record practically made for seven months, this organization explained it is clear that this prediction may come true. It pointed out that the course of events carried employment in manufacturing establishments in June, 1936, to a point higher than at any time since October, 1930. If, it added, the second half of the present year has usual relations to the first half, employment in manufacturing will be back to the level of the spring of 1930.

Secretary of Labor Perkins, in reporting on June conditions, declared that this marked the fourth consecutive month in which gains in employment have been shown in the combined manufacturing and non-manufacturing industries surveyed monthly by the Bureau of Labor statistics.

There was, however, seen a word of warning in the Chamber of Commerce report, that "extraneous influences, outside the normal operations of business processes, can * * * prevent this result."

This review pointed out that manufacturing has not been alone in going forward. In the first six months of 1936 construction undertaken would seem to have aggregated in value at least 75 per cent more, for the country as a whole than in the corresponding part of 1935. The figures published by the building trades unions show that more of their members are now employed than in the spring of 1930.

Steadily growing activity appears in other fields, too. For example, between January and the beginning of summer this year, the number of persons employed in retail trade increased at least 178,000, the number employed by railroad increased at least 68,000 and the number employed by power companies at least 8,000.

The movement of goods through the channels of transportation has risen proportionately. In the second quarter of 1936 movement by railroad was better than the forecast of the regional shippers' advisory boards which in advance concluded that railroad freight in carloads would be up by 9 per cent over the second quarter of 1935. Their forecast for the third quarter is an increase of 10.7 per cent. There is every evidence that the traffic by highways has at least kept up with the quickening of traffic by rail.

Foreign trade also has been growing and making its additions to the volume of business transacted within the country. In the first six months of the year the value of domestic merchandise exported at $1,134,000,000 was 13 per cent more than for the first half of 1935, and 72 per cent over the value in the first half of 1933 The value of exports in the month of June, 1936, at $180,000,000 was 8 per cent over the value for June, 1935, and 53 per cent over the value for June, 1933.

Imports of goods for use in the United States have been rising at an even more rapid rate. At $1,151,000,000 in the first half of 1936, they were 17 per cent higher than in June, 1935, and 95 per cent higher than in June, 1933.

"To the other indicators of trends in industrial activity is to be added, of course, the figure for the amount of electric energy that is used," the report declared. "The readily available data on a nation-wide basis are for electric energy used for all purposes, but it is well known that the part of the total going into industry uses has been increasing. Toward the end of 1935 total demand for electric energy passed all earlier records. From the beginning of 1936 this high level was well maintained, with an upward tendency in early summer contrary to a usual trend downward at this season. The country is now using between 15 and 20 per cent more electric energy than in the middle of 1929.

"How people spend their money affords pretty good evidence of general conditions. Exact figures which are current and nation-wide are hard to find, but there are a few available in connection with the excess tax of the Federal Government. From these figures it appears that in June the number of 5 cent cigars produced topped all records, and was a good third over the figure for June, 1929. There is the same story about cigarettes, of which 14,000,000,000 were turned out in June, 1936, or substantially more than in any earlier month. In June of this year taxes collected for admissions to theatres and the like were a third higher than in June last year. Taxes paid on mechanical refrigerators showed a 50 per cent increase in dollar volume of those sales."

Textbook Sales Hold Up Well

R. S. Kellogg secretary of the Joint Textbook Committee of the Paper Industry reports as follows:—

"The McGraw-Hill Book Company report sales of 222 volumes of the textbooks upon Pulp and Paper Manufacture during the first half of 1936.

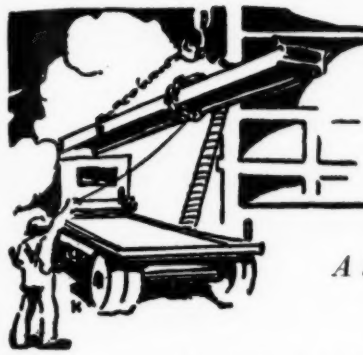
"With Volume III out of print and under revision, sales of the other four volumes so far this year have totaled 218 copies, compared with sales of 327 copies of these volumes during the twelve months of 1935.

"The manuscript and illustrations for an entirely revised Volume III which deals comprehensively with the preparation and treatment of wood pulp have gone to the printer. When the new edition is published it is expected that sales will increase materially in view of the sustained demand for this important volume in the textbook series.

"A glance at the record shows that these textbooks, which are of fundamental importance to the pulp and paper industry throughout the world, first became available with the publication of Volume I in February 1921, the original series being completed with the publication of Volume V in 1925. The total for the five volumes was nearly 2,800 pages.

"The second edition of Volume III came out in March 1927, the second edition of Volume IV in September 1928, and of Volume V in April 1929. Volumes I and II which cover elementary subjects do not need revision. Total sales of individual volumes to date exceed 25,000 copies.

"Immediately after completion of the third edition of Volume III, corresponding revisions of Volumes IV and V will be pushed to completion as rapidly as possible under the direction of Editor Stephenson and with the assistance of many of the best known technical and operating men in the North American paper industry."



CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Olean, N. Y.—The Kieckhefer Container Company, West Canal street, Milwaukee, Wis., manufacturer of corrugated paper boxes and containers, cartons, etc., has awarded general contract to Blaw Knox Company, Blawnox, Pittsburgh, Pa., for new one-story plant at Olean, where site has recently been acquired in vicinity of Reed and Seventh streets. New unit will be occupied by the Eddy Paper Corporation, first noted address, a subsidiary interest, manufacturer of corrugated and other boxes and containers, with mill at Three Rivers, Mich. Plant will be 80 x 250 feet, reported to cost over $70,000, with equipment. Superstructure will be placed under way at once, having plant ready for service early in the fall.

Newark, N. J.—The Essex Paper Box Manufacturing Company, 67 Goble street, manufacturer of paper boxes and containers, has concluded negotiations for purchase of former factory of the John Reilly Leather Company, avenue C and Astor street, comprising large main unit and smaller buildings on tract of 5½ acres of land. Property has been idle for a number of years and will be remodeled and improved by Essex company for a new plant. Equipment will be installed at early date, with large increase in present capacity. New owner contemplates the construction of an additional building on adjoining site. John Lumbaise heads the company.

Niagara Falls, N. Y.—The General Abrasive Company, College avenue, manufacturer of abrasive paper products, has completed plans for new addition to local plant, to be one-story, reported to cost over $40,000, with equipment. General contract has been awarded to Laur & Mack, 1400 College avenue, city, and work will be placed under way at once.

Chicago, Ill.—The United States Gypsum Company, 300 West Adams street, Chicago, manufacturer of wallboard products, etc., is carrying out a construction program for new plant units in the Middle West district, for large expansion in present production and facilities. Contract has been awarded to the Campbell, Lowrie & Lautermilch Corporation, 400 West Madison street, Chicago, for new one-story addition to factory branch, storage and distributing plant at St. Joseph, Mo., reported to cost over $45,000, with equipment; award for structural steel framing has been sublet to the Duffin Iron Works, St. Joseph, and erection will be placed under way at once. Company will also build a similar unit at Hermosa, Ill., reported to cost close to a like sum, for which plans are now nearing completion. A one-story addition will be built to company plant at Kostner and Wabansia avenues, Chicago; plans for the unit are being drawn by Clauson & Company, Inc., Builders' Building, Chicago, and it is expected to begin work on superstructure at early date. It is estimated to cost over $60,000, with equipment. As recently reported in these columns, company has approved plans and awarded general contract for a new branch plant at Heath, Mont., to be one-story, 58 x 422 feet, estimated to cost approximately $110,000, including equipment. A portion of the unit will be used for storage and distribution. Work on superstructure is being started by the James Leck Company, 211 South Eleventh street, Minneapolis, Minn., general contractor, and building is scheduled to be ready for service in the fall. Subcontract for structural steel framing has been awarded to the Bethlehem Steel Company, St. Paul, Minn., and Bethlehem, Pa.

Rochester, N. Y.—The Haloid Company, 6 Haloid street, manufacturer of photographic and other processed paper stocks, has plans under way for new two-story and basement addition to plant. Bids are expected to be asked on general contract at early date. It is estimated to cost over $50,000, including equipment. S. Firestone, 59 South avenue, Rochester, is architect and engineer.

Wilmington, Del.—Fire, July 13, destroyed a section of the former Delaware Mills of the Jessup & Moore Paper Company, foot of Madison street, with loss reported as considerable. The plant has been abandoned and is now being dismantled. This is the second fire at the property within the past few weeks.

Fort William, Que.—The Great Lakes Paper Company, Ltd., sustained a fire loss at local mill on July 18, when a portion of one of the plant units was damaged. An official estimate of loss has not been announced. It is proposed to replace the loss in near future.

Vancouver, B. C.—J. P. Meehan, Vancouver, representative for a company manufacturing viscose rayon products, name temporarily withheld, has negotiations under way with municipal officials for power supply from city development in the Cheakamus district, to be used for operation of a proposed new mill in that area. The Vancouver Civic Utilities Committee is in charge of municipal power resources and will make early decision in the matter, now expected to be favorable. Proposed plant will comprise several large one and multi-story units, with equipment to give employment to an initial working force of about 1,000 persons. It is estimated to cost over $2,000,000, with machinery.

Canberra, Australia—The British-Australian Pulp and Paper Company, Ltd., lately referred to in these columns, has taken out a charter with capital of 3,000,000 pounds ($15,000,000) in one pound shares ($5.00). New company has an extensive group of organizers and directors, including P. R. Higgins, chairman of Board of Directors, Standard Cement, Ltd., Canberra; A. G. White, A. H. Stevenson, H. H. White, E. R. White, G. S. Helburn, A. J. MacLachlan, G. L. Sly, W. J. Fullerton, H. H. White, T. M. Scott, J. M. Campbell and others, all of Canberra and identified with local industrial interests. As previously reported, new company has plans under way for a new pulp and paper mill, with main pulp units to be lo-

cated at Collingwood Bay, Papua, New Guinea, where large tract of land has been secured, including timber properties for raw material supply. The paper mill will be situated at Port Stephens, New South Wales, Australia, where a site of about 700 acres of land has been selected. Initial plants are estimated to cost close to $5,000,000, with equipment, in which amount immediate financing has been authorized. Mr. Higgins, first noted above, will be chairman of the Board of the new company.

New Companies

Chicago, Ill.—The Universal Paper Products Company, 1 North La Salle street, has been organized with capital of 20,000 shares of stock, no par value, to deal in paper goods of various kinds. The incorporators include Edward F. Wallbaum, Wallace R. Sollo and James S. Shannon.

New York, N. Y.—The Fibre Pulp Corporation has been incorporated with capital of $30,000, to manufacture and deal in pulp products. New company is represented by the Albany Service Company, 315 Broadway, New York.

Chicago, Ill.—The Advance Burlap and Paper Company, 2413 South State street, has been chartered with capital of 1,000 shares of stock, no par value, to deal in waste paper products. Principal incorporators are H. Weinstein and Jerome Sampson.

Progress of TAPPI Testing Methods Reported

Substantial progress in the further development of standard paper testing methods by the Technical Association of the Pulp and Paper Industry, is reported in the annual report of the Paper Testing Committee by the Chairman, B. W. Scribner, of the National Bureau of Standards. The report is contained in the June 18, 1936, issue of PAPER TRADE JOURNAL. It covers the developments during 1935.

Methods for acid-soluble iron and arsenic, and revisions of the standard methods for amount of mineral coating, water resistance and tearing strength were adopted by the association as tentative methods. Proposed methods for amount of zinc and titanium pigments, dirt count, and stretch, and proposed revisions of the present standards for thickness, bulk, tensile strength, fiber analysis, and opacity were completed by subcommittees. Progress was made in development of new or improved procedures for water resistance of areas of paper and paperboards adjacent to their surfaces, grease resistance, resin, active sulphur, and water vapor permeability.

There are now thirty-nine TAPPI standard paper testing methods. A list of them can be secured from the Chairman of the Paper Testing Committee, and copies can be purchased from the Secretary of the Association, R. G. Macdonald, at 122 East 42nd street, New York N. Y. for 25 cents each.

New Thermometer Design

The features of thermometer design which have been developed in modern practice are incorporated in this new Republic thermometer.

This new gas-filled recording thermometer introduces a helical coil which is "cartridge sealed" as a protection against dirt, moisture and damage by handling. The helix, capillary tubing and sensitive bulb are welded together, filled with nitrogen gas, calibrated and sealed, in the laboratory, to form a complete thermal unit. This unit can be readily removed from the reading instrument for recalibration, repair or change of temperature range, without disturbing or exposing any mechanism.

Sensitivity, accuracy and trouble free performance are the features stressed in this new design, which was developed for modern industrial use. The instrument has a wide range of applications and standard bulbs are available for measuring flue gas temperatures, average temperatures of large areas, temperatures in open vats or tanks, closed tanks under pressure or vacuum, pipe lines, refrigeration systems, drying rooms, ovens, kilns, air ducts, insulated tanks, etc. Operating ranges are between —20 F. and +1000 F.

The reading instrument may be placed at any point up to 200 feet from the point of temperature measurement, with the instrument so compensated that the effects of temperature changes on the capillary may be disregarded. Capillary tubing is furnished with various types of protective armor.

The reading instrument is attractively mounted on a 16 x 16 inch black steel panel. The bezels are aluminum. A dustproof door protects the chart. The recorder is complete with automatic pen lifter and non-removable chart knob. Either electrical or mechanical clocks may be furnished.

Sulphate Mills Require No Purchased Fuel

Purchase of fuel and electric energy by sulphate pulp and paper mills is unnecessary, according to V. D. Simons, 435 North Michigan avenue, Chicago.

Mr. Simons makes this remarkable statement after more than thirty years of consulting engineering experience within the pulp and paper industry.

This experience began with some early electrification work within the industry, work dating back to 1903, and ever since then Mr. Simons has been contributing to the advances being made by the industry in the more efficient generation and utilization of power. He also has been responsible for the design and construction of some of the industry's most outstanding mills, a number of which are among the more prominent mills on the Pacific Coast. Mr. Simons likewise has been active in the modernization efforts of a number of older mills.

All of this work has kept him in touch with technological improvements within the industry and within the engineering field in general. It has allowed him to accumulate a vast fund of engineering data which upon analysis now makes it possible for him to make the statement that no purchased fuel is required by sulphate pulp and paper plants if they are equipped to utilize to best advantage the energy that is available to them in the solids of the black liquor and through a reduction of steam and power requirements elsewhere.

Steam economies, states Mr. Simons, can be accomplished through altering the process of multistage evaporation, through evaporation of black liquor to dryness and its resulting heat economy over a one to one ratio of evaporation in the furnace, through maintenance of proper temperature of chemicals to digester, through use of a high concentration of white liquor and maximum amount of black liquor per digester charge, through thorough washing of pulp with minimum amount of water, through reclamation of flash steam from blow to heat wash water.

The combination of these economies with proper boiler and turbine cycle to generate required power and to furnish process steam will permit the average mill, comments Mr. Simons, to provide more than 1000 kilowatt hours for each ton of pulp produced.

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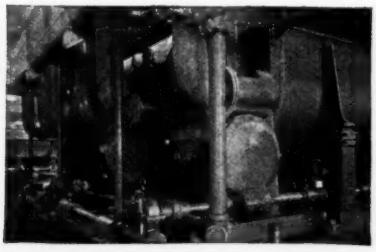
BIRD  SCREEN

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FUTURE MEETINGS

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Summer International Meeting in Canada, August 3 to 7, Montreal, Quebec, The Saguenay. Details may be obtained from the secretary, R. G. Macdonald, 122 East 42nd street, New York.

PAPER MILLS SECOND QUARTER EARNINGS COMPARE WELL WITH PREVIOUS PERIODS

Second quarter earnings of the majority of paper concerns compared favorably with results in both the preceding three months and the second quarter a year ago, so that profits for the first half were well in excess of those for the initial six months of 1935, the Standard Statistics Company, the well-known statistical authority, finds in a survey that it has just completed of the paper situation. Paper board companies may prove an exception, higher raw material prices due to storms in the first quarter having reduced profits. Most of these concerns, however, are expected to report considerable improvement in earnings for the second quarter.

Well-sustained general business activity during the three months recently ended resulted in heavy demands and stronger prices for printing, kraft, boards and other lines of paper. The rising trend of output is shown in the following statistics compiled by the American Paper and Pulp Association from the ratio production of about 300 miles in per cent of capacity:

In June 1935, 72.3 per cent, 1936, 80.9 per cent; May 1935, 69.4 per cent, 1936, 81.3 per cent; April 1935, 70.0 per cent, 1936, 82.3 per cent; March 1935, 70.5 per cent, 1936, 76.0 per cent; February 1935, 70.0 per cent, 1936, 77.9 per cent; January 1935, 65.8 per cent, 1936, 75.1 per cent.

The paperboard division, not included in this compilation, made a similar showing, with operations at 68.7 per cent of capacity in the first five months, against 65.5 per cent in the similar 1935 period and 61.7 per cent in 1934. In April and May production was above 71 per cent of capacity, whereas last year it was 64.8 per cent in April and 62.7 per cent in May.

With the possible exception of paperboard, production in the majority of paper lines will show a normal seasonal recession in the third quarter. Volumes, however, will undoubtedly continue higher than a year ago, which, with prospective firm prices, will permit maintenance of the earnings improvement displayed thus far this year. Paperboard, again, may be an exception, for production and profits in this division during the second half of 1934 were particularly satisfactory.

Canadian newsprint production in the first six months was 15.8 per cent higher than in the similar period a year ago and is currently at new record levels. Output in the six months ended June 30, totaled 1,487,884 tons, against a previous high for those months of 1,311,332 tons in 1929.

Gains during the remainder of the year will be narrower, for production increased sharply in the closing months of 1935. A relatively high rate of activity is expected, nevertheless.

In contrast with the record of the Canadian industry, United States output of newsprint in the first six months of 1936 was practically unchanged from that for the similar 1935 period. The total of 460,138 tons was only 2,800 tons above the low point of the past ten years, reached in 1933.

With demand for the combined output of Canada and the United States showing sustained improvement, however, prospects still favor a price increase as of the beginning of 1937. Although no definite indication of the prospective quotation on next year's contracts is yet available, a price in the vicinity of $43 a ton appears most logical. This would be $2 above the present price, which would not make the newsprint industry suddenly prosperous but which, on the other hand, would not be sufficient to bring additional plant capacity into operation.

WEATHERING QUALITY OF ROOFING FELTS MADE FROM VARIOUS FIBERS

Less expensive fibrous materials than the cotton rags usually used can be utilized satisfactorily for the manufacture of roofing felts, according to the results of tests conducted at the National Bureau of Standards by O. G. Streiter, research associate of the Manufacturing and Industrial Research Committee of the Asphalt Shingle and Roofing Institute.

Experimental felts were made of cotton rags and various mixtures of cotton rags, old jute and manila bagging, old newspapers, sulphite wood pulp and wood sawdust. Some of the felts were made in a commercial mill but those containing the larger amounts of "substitute material" were made in the Bureau mill as the equipment of the former was not suitable for these products. Tests of the felts for strength and asphalt saturating quality showed that felts satisfactory in these respects could be manufactured from cotton rags with the addition of these substitute materials without difficulty.

The felts were made into two sets of commercial roofings in a commercial mill, one set being simply saturated with a relatively soft asphalt and the other saturated and

then coated with a somewhat harder asphalt. Both sets were exposed outdoors on the roof of a Bureau building, and at various intervals up to 7 years were tested for extent of deterioration, as indicated by loss of weight and strength, decrease in thickness, degree of exfoliation of asphalt, and change in water absorptiveness. In all cases, there was no significant difference in weathering quality that could be attributed to the kind of fiber present. As is to be expected, the asphalt coating protected the saturated felts from weathering. It was found also that the felts made in the Bureau mill weathered better than the others, and this is attributed to their greater compactness, which decreased the exfoliation of the asphalt. Their compactness was due to fiber composition and a slightly prolonged beater operation which brushed out the fibers and caused them to become shorter and slightly gelatinized on the surface.

New Book on Patentability and Validity

Charles W. Rivise, chairman of the Patents Committee of the Technical Association of the Pulp and Paper Industry, and his partner, A. D. Caesar, have recently had a book published by the Michie Company on "Patentability and Validity," 754 pages.

It is the only treatise devoted to this subject and each topic is illustrated by facts and rulings of the most pertinent and recent decisions. The introductory chapter covers not only the fundamentals underlying our patent system, but also such important subjects as the presumption of validity attaching to a regularly issued patent, the effect of the public reaction upon validity, defenses in an infringement suit affecting validity and the circumstances under which a defendant may be precluded from disputing the validity of the patent in suit.

Novelty and anticipation are covered in all their phases and ramifications. The subject of invention is treated exhaustively in three chapters. Individual chapters are devoted to inventorship; the patent application and disclosure; the claims; and patent office prosecution.

The chapter on the forfeiture of the right to patent protection covers not only abandonment of the invention, but also the circumstances under which a patentee may be precluded from enforcing one apparently valid patent as well as restriction of the scope of a patent by acquiesence in Patent Office rejections.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd street, New York for $10 postpaid.

Joy Products Corp. to Locate at Little Falls

CARTHAGE, N. Y., July 27, 1936—The Joy Products Corporation which was organized by William A. Peck, the principal product being a complete all-paper diaper, has decided to locate at Little Falls, N. Y., in the plant of the Burrows Paper Corporation. Andrew Burrows has become financially interested and a number of Carthage citizens have purchased stock in the concern.

It was Mr. Peck's original intention to remain in Carthage and have the business located here but owing to lack of financial support, the corporation finally decided to accept the proposition of Mr. Burrows to locate in Little Falls where the Burrows Paper Corporation manufactures the grades of paper required for the diaper product.

The sewing machines, collating and perforating machines which are being built by the Carthage Machine Co. are nearing completion and it is expected that the machines will receive their initial tests here before being removed to the Little Falls plant.

Production Ratio Report

The statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

Month	1936	1935	1934
January	76.1%	65.8%	.....
February	77.9%	70.0%	.....
March	76.0%	70.5%	.....
April	82.3%	70.0%	.....
May	81.6%	69.4%	.....
June	80.7%	72.3%	.....
July (b)	.....	67.8%	.....
August	.....	70.9%	.....
September (c)	.....	75.0%	59.4%
October	.....	75.6%	64.7%
November	.....	75.3%	61.7%
December (a)	.....	74.3%	62.1%
Year	.....	71.2%	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1936		CORRESPONDING WEEKS, 1935	
*July 4 (b)	82.7%	July 6 (b)	58.5%
*July 11	74.6%	July 13	69.1%
*July 18	79.8%	July 20	71.8%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: July 4, 1936	July 11, 1936	July 18, 1936
0% to 50%	90	95	65
51% to 100%	236	219	147
Total Mills Reporting	326	314	212

* Subject to revision until all reports are received.
These data exclude (a)—Christmas Day, (b)—Fourth of July, (c)—Labor Day.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

1934	1935	1935	1936
Sept. 62%	Jan. 61%	July 59%	Jan. 61%
Oct. 63%	Feb. 67%	Aug. 65%	Feb. 67%
Nov. 56%	Mar. 67%	Sept. 69%	Mar. 68%
Dec. (a).. 53%	April 61%	Oct. 76%	April 70%
	May 61%	Nov. 70%	May 68%
	June 65%	Dec. 60%	June 68%

Week ending July 4, 1936—65%
Week ending July 11, 1936—53%
Week ending July 18, 1936—71%

Crown Willamette Makes Good Report

Crown Willamette Paper company reports for the year ended April 30, net profit after charges and taxes $1,961,916, equal to $9.81 a share on the first preferred stock, as compared with $1,467,615, or $7.33 per share first preferred, for preceding fiscal year; gross profit $5,808,147, against $5,630,566; depreciation $2,068,450, against $2,295,696; depletion $473,052 against $485,263; bond interest $893,346, against $1,073,459; taxes $406,370, against $281,158; cash $1,776,044, against $1,781,861; notes and accounts receivable less reserve $2,836,350, against $2,779,633; due from employees $11,725, against $10,949; inventories $5,832,257, against $5,521,553; current liabilities $3,716,009, against $3,861,719 (includes $1,124,550 for bond redemption). (B)

Bettis Co. to Build Carton Plant

ZANESVILLE, Ohio, July 27, 1936—The Bettis company of Zanesville, has awarded a contract to James Thompson Jewett contractor, for the erection of a new factory building at Scio, Ohio. It will be 60x100 feet in dimension, of tile and brick construction and will be ready for occupancy in the late fall.

The building will be used by the Bettis company for a plant to be devoted to the manufacture of paper cartons

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Raw Materials

Production of Halfstuffs from the Wood and Bast of Mulberry Branches. M. N. Tzuipkina, A. M. Kurennova and L. V. Egorova. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi. Prom. Materialui 1934, no. 4:67-100; C. A. 29:7644.—In the mechanical decortication of sericultural waste branches of white mulberry (*Morus alba*), it is impossible by subsequent treatment completely to separate woody matter from the bast. By the proposed chemical process it is possible in one operation to decorticate the bast, and to convert it and the woody matter into corresponding halfstuffs. The process consists of treating the branches at optimum conditions of 100° for 3 hours with one per cent. sodium hydroxide and subsequent separation of the wood and bast products with water in a specially designed apparatus. The wood pulp is reworked on a rod mill for 6-8 hours, giving 62 per cent of pulp with the consumption of 111 kg. sodium hydroxide for one ton of pulp. The bark is separated in the washing (1.7-2.7 per cent yield). It is partly mixed with short-fiber bast and is suitable for the production of felt-like sheets. Bast half-stuff is obtained in 42 per cent yield. Reworking of bast in a rodmill gives poor results, because of the destruction of the fibers. Bast pulp, bleached with consumption of 5 per cent chlorine, with its content of 88.6-93.8 per cent of alpha-cellulose, copper number 0.21-0.34 and fiber length of 2.5-4 mm., resembles rag halfstuff.—C. J. W.

Use of Fir in the Production of Mechanical Wood Pulp and Sulphite Pulp Suitable for Reworking into Newsprint At a High Paper-Machine Speed. D. Ya. Plechev. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom. Materialui 1934, no. 4:211-36; C. A. 29:7644.—Fir gives considerably lower yields of pulp than spruce; this is partly caused by the lower density fir (15 per cent). Fir is more rapidly cooked than spruce; the pulp contains less resinous matter and pentosans at the same hardness. In the length and width of fibers, mechanical strength and bleachability fir and spruce pulps are similar. Large-scale experiments with the production and use of chemical and mechanical pulps showed that a standard grade of newsprint can be obtained at the paper machine speed of 310 m./min. under normal conditions from 100 per cent fir pulp or a mixture of fir and spruce pulps. The composition of newsprint is 23-28 per cent chemical pulp and 72-77 per cent mechanical pulp. Production of a hard, unbleached sulphite pulp suitable for newsprint is practicable from 100 per cent fir or a mixture of fir and spruce. Satisfactory results were obtained by cooking fir alone or in various mixtures with spruce, containing 40 per cent moisture, with acid containing 3-4 per cent sulphur dioxide and 0.7-0.9 per cent lime at the initial temperature of 35.-50°, followed by heating to 110°, steeping at this temperature for 1 hour, cooking at 145° for 7-7.5 hours and steeping at this temperature for 1.5 hours. Fir gives 20-23 per cent less pulp than spruce. Mechanical pulp suitable for reworking into newsprint was obtained from fir or a mixture of fir with 40 per cent moisture content. Dry chips gave inferior products with a considerable output of electric energy in the process of defibering. One ton of fir gave 264 kg. of mechanical pulp and 1 ton of spruce 303 kg. The various procedures used in the pulping, bleaching and defibering are described in detail and the results of testing are tabulated and discussed.—C. J. W.

Use of Corn Leaves and Stalks for Production of Paper. .K. A. Dolgov. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom. Materialui 1934, no. 4:35-67; C. A. 29:7647.—From the tabulated results of a complete analysis and experimental pulping of stalk, stalk cores and leaves of Sterling, Minnesota and Brown country corn, cultivated in Ukraine, Dolgov concludes: corn leaves and stalks are suitable for the production of medium grades of printing paper, special grades of parchmentized paper, wrapping paper and cardboard. All grades of paper contain some chaffy matter. The optimum conditions of pulping are at 140° for 3-4 hours with (1) 4 per cent sodium hydroxide plus sodium sulphate and 14 per cent sodium sulphite or 8 per cent sodium hydroxide plus sodium sulphide and 7 per cent sodium sulphite, (2) 16-18 per cent sodium hydroxide plus sodium sulphide and (3) 15-16 per cent sodium hydroxide on the oven-dry weight of cellular material. No improvement in the uniformity of pulped stock or the yield resulted by preliminary extraction of the materials wtih water or alkalies. Corn pulp is diffi-

cultly bleached, giving a yellowish product with a consumption of 5 per cent of active chlorine. The addition of sodium sulphite to the cooking liquor gives a pulp of lighter color more easily bleached. Pulping with moderate amounts of alkalies at high temperatures results in the formation of dark-colored decomposition products of sugars and a more highly discolored stock difficultly bleached. Corn pulp obtained by various methods of cooking and bleaching possesses a high degree of "natural" wetness averaging 44-46° freeness. For the production of better grades of printing paper the uncooked parts in the pulp must be removed before bleaching by a more thorough refining and screening. Leaves give a pulp of the highest degree of natural fineness (55° freeness) and the outer stalks layer (20° freeness). Corn-cellulose fibers are capable of parchmentization to an unusual degree; they give with a little additional reworking a pulp with 65-75° freeness and a transparent parchment-like paper of high mechanical strength and imperviousness to oil and air. The presence of 18.5 per cent of water-extractable matter in the corn waste in addition to some other causes cause the relatively low yields of pulp averaging 36 per cent on the oven-dry material. Pulps obtained, e. g., with 10-12 per cent sodium hydroxide or 14 per cent sodium hydroxide plus sodium sulphide, possess the properties of a sized stock and give papers of high mechanical properties (breaking length of several hundred double bends, tearing strength about 6 kg./m.) suitable for packing materials (cement bags, barrel-linings, etc.). Stalks and leaves macerated with 9 per cent sodium hydroxide or sodium hydroxide plus sodium sulphide give a low grade of wrapping paper with satisfactory mechanical properties. Production of the higher grades of printing paper from corn waste is less economical than from straw. Corn waste is economically suited for the production of a special grade of parchmentized paper of good quality.—C. J. W.

The Southern States, a Future Center of the American Pulp and Paper Industry. E. Waldenström. Svensk Pappers-Tidn. 38, no. 18:588-590, 593-594, 599-603 (Sept. 30, 1935).—The author reviews the efforts made in the United States for establishing a self-supporting sulphite industry in the Southern part of the country and discusses in detail the research work done by Herty and his coworkers in the Savannah laboratory.—C. J. W.

Production of High-Grade Halfstuff from Fibrous Materials Containing Chaff. T. K. Bel'skii. Bumazhnaya Prom. 14, no. 5:65-72 (May, 1935); C. A. 29:7072.—Various methods and equipment used in the U. S. S. R. for reworking into halfstuff of different kinds of textile flax and hemp waste and rope waste are critically discussed. A procedure for reworking of tow and rope waste by the use of specially constructed apparatus with intermediate cooking is described. The process results in satisfactory separation of hurds and a halfstuff suitable for economical production of a good grade of rag paper.—C. J. W.

Production of Bleached Halfstuff from Mulberry Bark. Z. V. Uchastikina and V. Ya. Matveev. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom., Materialui, 1934, no. 4:100-107; C. A. 29:7072.—A large scale procedure is described for pulping bark of waste mulberry branches of the sericultural industry with 14 per cent sodium hydroxide (on the weight of oven-dry bark) at 3.5 atmospheres for 7.5 hours or at 3 atmospheres for 8.4-9 hours and bleaching with 5 per cent of active chlorine. The product is equal in quality to rag stock.—C. J. W.

Chemical Studies on the Woods from Manchuria. I. The Constituents of Woods from Sungari Region in Kirin. Kitsuji Nishida, Tokuichi Fukamizu and Hideao Hashima. Cellulose Ind. (Tokyo) 11, 66-73 (1935).—The total cellulose, alpha-cellulose, mannan, pentosan and 1 per cent caustic soda soluble were determined in *Larix dahurica* Turz cz., *Pinus koraiensis* S. and Z., *Abies holophylla* Max., *Juglans mandshurica* Max., *Populus Maximowiczii* Sarg., *Salix caprea* L., *Quercus mongolica* Fisch., *Maackia amurensis* Benth., *Phellodendron amurene* Rupr., *Acer Ginnala* Max., *Acer mono* Max., *Tilia amurensis* Kom., *Fraxinus mandshurica* Rupr., and *Syringa amurensis* Reepr. —A.P.-C.

Blue Stain Development in Peeled Shortleaf and Loblolly Pine Pulpwood. George H. Hepting. Paper Industry 17, 402-404 (Sept. 1935).—A report on a preliminary investigation. No appreciable difference was found attributable to differences in piling; this possibly is due to the fact that all the piles were small and that there was fairly good air circulation in all the pens resulting in approximately equal rates of drying and consequently of blue staining. Comparison of the staining of hand-peeled and machine-barked wood indicated 47 per cent for the former and 19 per cent for the latter.—A. P.-C.

Cellulose Pulp from Phormium (New Zealand Flax). J. S. Yeates. New Zealand Dept. Sci. Ind. Research 8th Ann. Rept. 17-18 (1934).—Green flax of average moisture content (65 per cent), when digested directly with 4 to 5 per cent caustic soda and 0.08 to 0.50 per cent sodium sulphite, gave a maximum yield of 14.8 per cent of bleached pulp. The consumption of bleaching powder was very high when sodium sulphite was omitted from the digestion. The yield of good-quality pulp from ordinary scutched fiber was not more than 60 per cent.—A. P.-C.

Removing Printing Ink from Paper. B. M. Sorokin. Russian patent 35,550. March 31, 1934. C. A. 29:8332. The paper is passed through rollers or other disintegrating devices together with kaolin and water and then washed with water to remove kaolin together with the ink.—C. J. W.

Cellulose

Cellulose for Viscose Manufacture. Karl Fabel. Kunstseide 17: 42-46 (1935); C. A. 29, 7640.—Fabel describes and recommends the method of Weingand and Acker for the characterization of cellulose. Viscosity data obtained by this method are compared with those obtained by the cuprammonium method. Determination of the mechanical properties of films from viscose is described as another method of evaluation and details are given for the preparation of such films. Methods are given for the sulphuric acid, ammonium sulphate and total sulphate of the precipitation bath.—C. J. W.

Latest Achievements in Cellulose Chemistry. P. P. Shoruigin. Iskusstvennoe Volokno (Artificial Fiber) 6:231-240 (1935); C. A. 29: 7069.—A review of the literature for the last year and a half with 40 references.—C. J. W.

Quality of Cellulose. V. Postnikov. Iskusstvennoe Volokno (Artificial Fiber) 5:27-31 (1934); C. A. 29:7069.—Problems of improved production of cellulose of standard quality for the manufacture of viscose are discussed.—C. J. W.

The Reaction: Metal Hydroxide Solution-Cellulose Fiber. II. X-ray investigation of the reversibility of space lattice transformation with sodium hydroxide-cellulose. W. Schramek and H. Görg. Kolloid-Beihefte 42:302-328 (1935).—For a lengthy abstract *see* C. A. 29:7069-7071.—C. J. W.

Present State of the Determination of Oxycellulose. P. Heermann. Rayon and Melliand Textile Monthly 16,

no. 9:525-526; no. 10:619-620 (Sept., Oct., 1935).—A critical survey is given of the most practical reactions for determining oxycellulose. The most satisfactory tests are the methylene blue dyeing test for indicating oxycellulose with strong affinity for basic dyes; the silver test with ammoniacal silver solution for indicating strongly reducing oxycelluloses; the gold purple reaction of haller for sensitivity. Oxycellulose tests are influenced by other impurities in the fiber and are not easily capable of unequivocal or quantitative interpretation.—C. J. W.

Determination of Cellulose in Different Fibrous Raw Materials. E. Debenedetti and F. Pancirolli. Ind. carta 2, no. 6:289-296 (June, 1935).—Schwalbe's modification of the original Cross and Bevan chlorination method for the quantitative estimation of cellulose is not applicable to straw and similar materials. The authors advocate the use of the Cross and Bevan method with a single chlorination (about 45 minutes in the case of wood, 30 minutes in the case of straw) and describe a few technical modifications of the operating procedure which reduce the testing period to 4 hours.—C. J. W.

Microstructure of Cellulose. G. J. Ritter. Rayon and Melliand Textile Monthly 16, no. 9:522-524; no. 10:606-608 (Sept., Oct., 1935).—The author carefully reviews the existing material on microstructure of cellulose, discussing the elements which form the fiber, as well as the binding material and its nature. The article is well illustrated with photomicrographs and contains a bibliography of 40 references—C. J. W.

The Formation and Structure of Cellulose Membranes. Wanda K. Farr. Paper Trade J. 101, No. 13, 87-90 (Sept. 26, 1935).—The cellulose of the membranes obtained by Hibbert and Barsha from cultures of *Acetobacter xylinum* and the cellulose of the filamentous alga *Spirogyra* give the same reactions. The cellulose is part of the bacterial organism itself and is not synthesized by bacterial enzymes. In the cotton fiber membrane the fibrils are composed of microscopically visible cellulose particles, which have dimensions of about 10,000 x 15,000 Angstrom units, and which are coated with a binding material (probably composed largely of pectic substances with possibly traces of many other substances) amounting to probably not over 1 to 2 per cent of the membrane.—A. P.-C.

Further Investigation of the X-ray Diffraction Pattern of Native Cellulose. Usaburo Yoshida and Chullchai Park. Mem. Coll. Sci. Kyoto Imp. Univ. A17, 443-447 (1934).—Re-examination of the fiber diagram of native ramie cellulose in iron and chromium radiation shows that the previously proposed tetragonal cell is incorrect, bu that the accepted monoclinic cell with $a = 8.22$, $b = 10.33$, $c = 7.84$ and beta $= 84°$, is confirmed. The diagram in chromium radiation shows a previously unreported reflection on the equator; its indexes are 100 or 001, or both.—A. P.-C.

Colloidal Aspects of Cellulose. Ben W. Rowland. Paper Trade J. 101, No. 13, 98-100 (Sept. 26, 1935)—A survey of recent work on selected topics concerning the colloidal behavior of cellulose as related to technical problems of paper making, with bibliography of 34 references.—A. P.-C.

Methylene Blue Number of Cellulose. Brissaud. Mem. Poudres 26, 93-100 (1934).—The methylene blue number of cellulose is a measure of the amount of noncellulose substances and, when used for cotton linters, of the efficiency of the alkaline treatment.—A. P.-C.

Modified Cross and Bevan Method for Determining Cellulose in Wood. George J. Ritter and R. L. Mitchell. U. S. Forest Products Lab. Mimeograph R1028, April 1934.—Several precautions are emphasized. The fraction of wood sawdust passing 60-mesh and retained on 80-mesh screens offers fewest difficulties in manipulation; the water-wet sample should be dried by suction until fluffy to allow uniform penetration of the chlorine; after the final digestion with sodium sulphite the residue should be heated on the steam bath with 200 cc. of water for 2 hrs. to remove salts and acids, the presence of which hydrolyzes some cellulose during the final drying period. Such hydrolysis results in a low yield of alpha cellulose when subsequently determined on the cellulose residue. If the material becomes gelatinous during chlorination, thus causing difficulty in the filtration, the sample should be digested for 1 hr. on the steam bath in 200 cc. of water. Unless the ether from the final washing is removed by suction or heating in a steam oven, explosions may occur during the drying of the residue.—A. P.-C.

Comments on the lignin literature. B. Holmberg. Svensk Pappers-Tidn. 38, no. 18:586-587 (Sept. 30, 1935).—The author refutes a number of Klason's statements in previous articles.—C. J. W.

Hydroxyl Groups in Lignin. Pulin B. Sarkar. Science and Culture 1:60 (1935); C. A. 29, 7639.—Methylation of lignin in the ordinary way does not give accurate information as to the number of hydroxyl groups present since new hydroxyl groups are formed during isolation by partial decomposition of the dioxymethylene group. Methylation of pure jute lignin, separated at low temperatures and washed with dilute sodium hydroxide, with methyl sulphate and potassium hydroxide below 22°, gave a maximum methoxyl content of 34.51 per cent after exhaustive methylation. On the assumption of 19.18 per cent methoxyl in pure lignin, molecular weight 830, 5 additional methoxyl groups were introduced in the above methylation. Similarly, the acetylation of lignin isolated in the usual way and that produced at low temperatures gave compounds which showed the presence of 31-32 per cent and 29.45 per cent of acetic acid. The latter figure is in agreement with the assumption of the presence of 5 hydroxyl groups in lignin, molecular weight 830. The fact that the methoxyl values of the fully methylated product remained constant on refluxing with 28 per cent sulphuric acid or 2 normal alcoholic potassium hydroxide for 3-4 hours showed their ether linkage.—C. J. W.

Separation of Lignin and Cellulose by Ethyl Acetoacetate. IV. León Lemmel. Anales soc. espan. fis. quim. 33:389-390 (1935); C. A. 29:7071.—Ethyl acetoacetate dissolves lignin without reaction or decomposition at room temperature. When sawdust is soaked in concentrated hydrochloric acid and ethyl acetoacetate is added, lignin dissolves immediately, giving a dark-colored solution. The separation is quantitative.—C. J. W.

New Studies in the Field of Lignin Chemistry. N. I. Nikitin. Tzentral. Nauch. Issledovatel. Inst. Bumazhnoi Prom., Materialui 1934, No. 4:19-34; C. A. 29:7071.—A review of progress during the last ten years.—C. J. W.

Remarks Concerning Holmberg's Report, "Thioglycolic Acid As a Lignin Reagent." P. Klason. Svensk Kem. Tids. 47, no. 8:220-223 (Aug., 1935); Svensk Pap-Pers-Tidn. 38, no. 16:517-518 (Aug. 31, 1935).—Discrepancies are pointed out in the lignin content of the pine and the formula as determined by Holmberg's method when compared with that of Klason. Thioglycolic acid reacts with the aldehyde group which characterizes Klason's alpha-lignin but not with the alcohol group of his beta-lignin, so that Holmberg's values are generally low. Applied to the case of commercial waste sulphite liquor and corresponding mill calculations, Holmberg's method was again found to give low results.—C. J. W.

Bagasse. VI. Methyl and Acetyl Derivatives of

Bagasse Lignin. Yoshikazu Hachihama and Hachiro Saegusa. J. Soc. Chem. Ind. Japan 38 Supp. Binding, 310 (1935).—Bagasse lignin was methylated with methyl sulphate and a 10% caustic soda solution. Fully methylated lignin was obtained by two treatments, and it contained 31.77 methoxyl. The molecular weight, determined by freezing-point depression in benzene and by melting-point lowering in camphor, averaged 1210. Analysis of methyllignin gave the empirical formula $C_{60}H_{39}O_5(OCH_3)_{12}$; hence that of the original bagasse lignin must have been $C_{60}H_{39}O_5(OH)_6(OCH_3)_6$. Acetylation with acetic anhydride and pyridine gave a derivative containing 16.28% acetyl and 13.43% methoxyl; this suggests the empirical formula $C_{60}H_{39}O_5(AcO)_5OH(OCH_3)_6$ for acetyllignin.—A. P.-C.

Mechanical Process

Effect of Temperature and Consistency in Mechanical Pulping. E. R. Schafer and J. C. Pew. Paper Trade J. 101, No. 13, 71-76 (Sept. 26, 1935).—White spruce and loblolly pine pulpwood were ground at various temperatures and consistencies on several types of stone surfaces, in the U. S. Forest Products Laboratory's two-pocket experimental grinder, under carefully controlled conditions. In general, the grinding process is favored by high temperatures, provided excessive pulp consistencies are prevented by the use of warm shower water. High temperatures caused in nearly all cases an increase in grinding rate, a decrease in power consumption, and increase in the strength of the pulp, and a material increase in fiber length and freeness. Increase in the consistency of pulp in the grinder pit above 4% caused an increased power consumption, with a decrease in grinding rate. At the consistencies employed the grinding temperature had little effect on the color of the pulp.—A. P.-C.

Pressure Control System for Wood Grinders. Everett A. Mahannah assignor to International Paper Co. U. S. pat. 2,014,142, Sept. 10, 1935.—The pressure exerted on the film of oil between the grindstone shaft and its bearing is used to control, through suitable electrically operated means, the operation of the motor operating the wood feed. Increase in pressure of the oil film acts to slow down the motor, and vice versa.—A. P.-C.

Artificial Pulp Grinding Stones. Raymond C. Benner assignor to The Carborundum Co. U. S. pat. 2,017,228, Oct. 15, 1935.—High-silica sand particles of suitably graded size are bonded by mixing with proper proportions of high-calcium quicklime (about 99% CaO) and water, allowing to set under a pressure of 3000 to 5000 lbs. per sq. in., and hardening by subjecting to heat and pressure for a suitable period (*e.g.*, 120 lbs. per sq. in. of steam pressure for 11 hrs. for a stone 27 in. in diameter by 24 in. face).—A. P.-C.

Alkaline Process

Utilization of Wood High in Rosin. A. V. Vavulin and S. Ya. Korotov. Lesokhim. Prom. 4, no. 5:11-15; no. 6:7-11 (1935); C. A. 29:8310.—A pitch wood containing 8-12% rosin should receive a sulphate or sodium hydroxide treatment, yielding cellulose and rosin soap. If 12-16% rosin is present, extraction should precede the above treatment. When the rosin content is 16-25%, the wood should be extracted, or the rosin should be saponified and the wood refuse can be used for fuel. A rosin content in excess of 25% requires the removal of the rosin by pressure.—C. J. W.

Wood from Tapped Trees as Raw Material for Wood Chemistry. A. V. Vavulin and R. A. Kotovskaya. Lesokhim. Prom. 4, no. 3:15-19 (1935); C. A. 29:8309.—A general discussion on the preparation of cellulose and the usual by-products from wood.—C. J. W.

Influence of the Nature of the Wood Upon the Yield and Quality of Sulphite and Sulphate Pulp. II. Pine Wood. E. Hägglund, S. Ljunggren, H. Nihlén, and O. Sandelin. Svensk Pappers-Tidn. 38, no. 14:454-456 461-463 (July 31, 1935).—The wood samples were taken from three different districts in Sweden. The volumetric weight of the wood is generally smaller in quick-growing specimens. The formation of heartwood is retarded in colder climates. The fiber length varies between 1.8-3.2 mm., while the fiber width shows less variations. Length and width of the fiber decreases in the same tree from bottom to top. The quantities of extracts vary greatly in the different wood samples; the lignin content is fairly consistent, while the values of pentosans and ash are less uniform. The yields from the cooks varied between 43.8 and 50.9 per cent. Pulps prepared from the wood of tree tops are harder to beat than those from the trunk. The tearing length and bursting strength are higher, the initial tear is lower in the first case.—C. J. W.

Types of Cooking Pots for Pulping Straw. K. V. Breiveit. Bumazhnaya Prom. 14, no. 6:52-54 (June, 1935); C. A. 29:7072.—The advantages and disadvantages in using stationary and revolving pots for pulping straw are discussed.—C. J. W.

Lime Recovery in the American Sulphate Pulp Industry. J. Sjöström. Svensk Pappers-Tidn. 38, no. 15: 482-484, 487-488, 493 (Aug. 15, 1935).—The author describes lime recovery systems in the sulphate industry of this country, the chief developments having taken place during the last 6-7 years. The lime sludge with a moisture content of maximum of 40-45 per cent is burnt in rotary kilns; available calcium oxide of the recovered lime amounts to 85 per cent. Most plants use the Dorr continuous causticizing system or similar installations. Their success depends upon thorough purification of the green liquor and the milk of lime, as well as upon effective washing and dewatering of the filter cake. Proper feeding and careful operation of the kiln are also important factors. The possibility of introducing this method into Scandinavia is considered.—C. J. W.

Pulp from Aspen Wood According to the Chlorination Process. A. Krüger. Finnish Paper and Timber J. 17, no. 6:216, 218, 220-222, 224, 226 (March 31, 1935).—Krüger first discusses recent researches concerning the chlorination process and then reviews in detail the experiments of N. Rozenberger. The following problems were investigated: different methods of pretreating aspen chips before the actual chlorination; the relationship between the size of the chips and the chlorination results; a comparison between the bleaching with chlorine gas and chlorine water; the consumption of sodium hydroxide for the extraction of chlorolignin and its influence upon the final results. A pretreatment of the chips with sodium hydroxide solution at 10-20° was found to give a satisfactory product.—C. J. W.

Distribution of the Sulphate Soap During the Washing in the Diffusers. H. Bergström and K. N. Cederquist. Svensk Pappers-Tidn. 38, no. 17:571-572 (Sept. 15, 1935).—Only 28 kg. floating rosin are recovered per ton of sulphate pulp, while 32 kg. are lost in the black liquor sent to the recovery plant and 12 kg. in the wash water from the diffusers. The second waste could be reduced through improved washing methods, whereas with present recovery systems no possibility exists for cutting the loss from the black liquor.—C. J. W.

An Evaluation of South African Grown Pinus Patula Pulpwood by the Sulphate (Kraft) Process. P. J. A. Loseby. Bull. Imp. Insta. 33, 162-171 (1935).—The wood of Pinus patula is light colored, has an oven-dry weight of 20 lb. per cu. ft., a fiber length of 1.0 to 5.6 mm., average 2.6 mm., and a fiber diameter of 0.019 to 0.069 mm., average 0.039 mm. A series of ten laboratory-scale cooks were carried out on wood from small, immature, slow-grown, suppressed trees by the sulphate process. They yielded from 48.8 to 58.6 per cent on the oven-dry weight of the wood) of pulp of good appearance, having excellent bursting strength, but rather low tearing resistance as compared with that of imported pulp (attributed to the absence of refining treatment).—A. P.-C.

Method of Producing Paper Pulp from Fibrous Material. Edwin P. Jones and James M. Dempsey assignors to Champagne Paper Corp. U. S. pat. 2,018,490, Oct. 22, 1935.—Crude decorticated bast fiber, such as flax or hemp, which has or has not been subjected to the usual retting process, is treated for 15 to 30 min. in presence of cold water in a beater or rod mill, cooked with an alkaline reagent consisting of about 95 per cent of calcium hydroxide, sodium carbonate or sodium hydroxide and about 5 per cent of sodium sulphite, and subjected to a two-stage bleaching, the first stage being carried out with saturated chlorine water or hypochlorous acid or chlorine gas, and the second with calcium or (preferably) sodium hypochlorite.—A. P.-C.

Pulping Process for Bagasse. John P. Foster. U. S. pat. 2,013,042, Sept. 3, 1935.—The shredded bagasse is treated at about 160° F. for 1 to 3 hrs. with a 0.5 per cent to 1.5 per cent caustic soda solution or a 1 per cent sodium carbonate solution, washed, treated at about 160° F. for 2 to 4 hrs. with a 1.5 to 5 per cent nitric acid solution, washed, and treated at 120° F. for 3 to 6 hrs. with a 4 to 8 per cent caustic soda or sodium carbonate solution. A special beater for the treatment of the pulp consists of a tank with a conical bottom, inside which is a screen container of approximately the same shape as and spaced from the tank; steam coils are placed in the space between the tank and screen container, and just above the discharge opening at the bottom of the cone is mounted a propeller with blades of adjustable pitch.—A. P.-C.

Sulphite Process

Regeneration (of Sulphurous Acid and Relief Liquor) in Sulphite Pulping. M. Kopantzev. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom. Materialui 1934, no. 4:116-165; C. A. 29:7646.—Theoretical and experimental studies of the problems of recovery of sulphur dioxide and blow-off acid in connection with the production of tower acid and sulphite pulping led to the following conclusions: the quantity of recovered sulphur dioxide depends directly on the content of free sulphur dioxide in the cooking acid. For the cooking kettles of the Syaskii mill it is determined by the formula: percentage of sulphur dioxide = 1710 (free sulphur dioxide —1). The percentage of sulphur dioxide recovery is determined by the composition of the cooking acid and the formula: recovered sulphur dioxide = 90 x free sulphur dioxide —1/total sulphur dioxide. This formula with corrections for the work of recovery installation can be applied to the majority of Soviet pulp mills. The correction for the recovery plant of the Syaskii mill is 4-7 per cent because of the incomplete absorption of sulphur dioxide in the Stebbins tower. The formulas make possible comparison of the efficiencies of various recovery installations with adequate means of calculation and control of the production of tower and cooking acids. Forced circulation increases somewhat the percentage of sulphur dioxide recovery in comparison with the usual cooking. Energetic and deep reliefs result in the precipitation of calcium bisulphite and a pulp with a higher ash content. Extended steeping and slowly rising temperature increase the percentage of sulphur dioxide recovery. With better packing of woodchips in the digesters the percentage of regeneration decreases. The percentage of recovery of liquor for the same installation may fluctuate within wide limits. The quantity of recovered liquor depends on (1) the extent of filling of the digesters with acid, (2) the moisture content of wood chips and (3) the period of relief. The strength of the relief liquor increases with the increased contents of free sulphur dioxide in the cooking acid. With better packing of wood chips in the digesters the quantity of relief liquor decreases. The relief liquors contain 0.3 per cent lime. In all blow-offs, except the final one, the relief liquor consists chiefly of the liquor mechanically carried over, containing 3-7 per cent of the steam condensate. In the final relief liquor, especially at a pressure reduced below that of the saturated steam, steam condensate is the chief constituent. The consumption of sulphur depends on the composition of cooking liquor and to a greater degree on the content of the base than on the total strength. At a consumption of 10 cubic meters of cooking acid per ton of air-dry cellulose, the percentage consumption of sulphur is 5 total sulphur dioxide—4.5 (free sulphur dioxide—1). Cooking with strong acid without increasing the sulphur consumption is possible with the corresponding increase of yield or decrease of acid consumption per ton of pulp. Closer packing of wood chips in the digester decreases the sulphur consumption. At 20 per cent increase of wood packing the sulphur consumption is reduced 12-13 per cent. An increase of the excess of total sulphur dioxide and particularly of the combined sulphur dioxide, obtained either by increasing the strength and lime or the consumption of acid, leads to the increase of the specific sulphur consumption in pulping, which is probably caused by a greater degree of lignin sulfonation or a greater sulphur consumption for the side reactions. The losses of sulphur in the form of loosely bound sulphur dioxide in the final liquor increase with the increased concentration of cooking acid. The minimum consumption of sulphur for the decomposition of wood is 8-9 per cent of the pulp.—C. J. W.

Sulphite Cooking in its Modern Variations. N. N. Nepenin. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom., Materialui 1934, no. 4:3-19; C. A. 29:7072.—The theory and practice of the developments in the last ten years of the various phases of sulphite pulping of plant materials with bisulphite and sulphur dioxide solutions are systematically reviewed. The American rapid method of sulphite pulping are critically discussed.—C. J. W.

Development of a Pulping Process with Reliefs (of Liquor and Sulphurous Acid) At the Okulovskii Paper Mill. N. Balkov and N. Koneva. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom., Materialui 1934, no. 4:165-178; C. A. 29:7072.—Preliminary results of the experimental modification of the existing process of pulping with introduction of intermittent relief of liquor and sulphur dioxide are tabulated and discussed from technical and economic viewpoints.—C. J. W.

Sulphite Pulp Cooking. C. R. Bergson. Svensk Pappers-Tidn. 38, no. 16:519-520, 523-524, 529-532 (Aug. 31, 1935).—Sulphur consumption during the sulphite cooking process is discussed. A saving in sulphur can be accomplished by using a tower acid with a low initial sulphur dioxide content and enriching the same with recovery gases. Special care must be taken that an excess of bisulphite is present in the cooking liquor to the very end of the process,

especially when temperatures above 100° C. are employed. The lime requirement depends upon the cooking procedure. Experiments carried out under actual operating conditions have confirmed previous results, namely, that a lime content higher than that required to maintain the above mentioned excess of bisulphite has no influence upon yield and pulp quality. Neither does it affect the whiteness of the product, provided that the amount of free sulphur dioxide in the liquor does not fall below a certain limit.—C. J. W.

Abstract Regarding Investigations of Wood at Forss. A.-B Köpmanholm. N. Sundstedt. Svensk Pappers-Tidn. 38, no. 15:494 (Aug. 15, 1935).—Unbarked wood was submerged for definite periods in ordinary tap water and in water containing 0.6 per cent sodium chloride. The wood was then barked and the outer wood was cut into cooking chips and cooked by the sulphite method. The percentage of uncooked wood from that submerged in salt water was greater than in the case of that from the ordinary tap water bath. The shive count, however, was greater from the wood submerged in tap water. An under-water storage of ten weeks seemed necessary before these effects appeared. It is suggested that under these conditions certain tannin bodies diffuse from the bark into the outer wood, increasing the percentage of screenings and shives when the wood is cooked by the sulphite process.—C. J. W.

Corrosion of Alloys Under Conditions of Cellulose Production. O. I. Ver. I. S. Vuidrin and M. M. Romanov. Repts. Inst. Metals (Leningrad) No. 15:134-141 (in English, 142) (1935); C. A. 29:7071.—Special bronzes, plain and alloyed iron and special steels were tested in cellulose boilers, at the Syas cellulose plant. The cellulose was prepared by the sulphite process. Chromium-manganese steel containing C 0.20, Cr 17.26 and Mn 8.10 proved the most resistant alloy, showing a loss of 0.06 gram per square meter per hour.—C. J. W.

New Sulphite Mill At Jakobstad. H. Alfthan. Finnish Paper and Timber J. 17, no. 16:736, 738-740, 742 (Swedish); 731-732 (English) (Aug. 31, 1935).—A description is given of the new sulphite mill which has an annual output of 35,000 tons of pulp.—C. J. W.

Sulphite Cellulose. S. A. Fotiev, Russian patent 35,549. March 31, 1934. C. A. 29:8332. Sulphite cellulose is treated with calcium hypochlorite at a pulp concentration of 5-20 per cent at 15-40°, then with caustic at 60-80° and bleached in the usual manner.—C. J. W.

Pulp for Rayon. Seiji Kuwahata. Japan. Patent 110,240. April 6, 1935. C. A. 29:8330. Thoroughly dried and heated chips are charged into a digester, one part of ammonium bisulphite or magnesium bisulphite solution at about 50° is introduced and the remaining solution at about 100° and the whole is digested.—C. J. W.

Process of Preparing Sulphite Cooking Liquor. Ralph H. McKee. U. S. pat. 2,014,775, Oct. 17, 1935.—Cool sulphur burner gas is passed through a concentrated solution of a salt of an organic acid (preferably thiocyanic acid) capable of dissolving substantially more sulphur dioxide than an equal amount of water. Hot burner gases are subsequently passed through the solution to expel the dissolved sulphur dioxide which is absorbed in water in presence of a suitable alkali compound to form an alkali sulphite.—A.P.-C.

Process of Producing Sulphite Pulp. Gustaf Haglund. U. S. pat. 2,016,328, Oct. 8, 1935.—Cellulosic material such as wood is subjected to a preliminary cooking with a solution of sulphurous acid salts of an alkali metal containing substantially no free sulphur dioxide and subsequently a final digestion is carried out using a solution containing calcium bisulphite together with the quantity of free sulphur dioxide required to effect complete disintegration of the raw material. —A.P.-C.

Investigation of Physico-Chemical Factors Which Influence Sulphite Cooking. Raimbault de Montigny and O. Maass. Dept. Interior Can. Forest Service Bull. No. 87, 46 pp.—A detailed description is given of the investigations together with a discussion of the application of the findings to commercial operations.—A.P.-C.

Sulphite Waste Liquors

Abnormal Behavior of Skin in Concentrated Sulphite Cellulose Liquors. L. Masner and V. Samec. Collegium 1935:439-440; C. A. 29:8390.—Its use in tanning is discussed.—C. J. W.

The Significance of Alkalinity in the Preparation of Tannin Extracts from Sulphite Cellulose Extracts. L. Masner and V. Samec. Collegium 1935:434-438; C. A. 29:8390.—The color of sulphite cellulose extracts increased with pH; boiling did not improve the extract and caused darkening. Making the extract strongly alkaline did not change its tannin content or tanning power, but decreased the size of the molecule, destroyed fermentable sugar and liberated sulphur dioxide. In general, in alkaline purification of sulphite cellulose liquors, only a low alkalinity and a small amount of soda is permissible. Enough sodium carbonate to precipitate about 90 per cent of the lime is sufficient.—C. J. W.

Cooking Cellulose. S. I. Chuvikovskii and G. I. Lyakhovetzkii. Russian patent 35,175. March 31, 1934. C. A. 29:8331.—Spent sulphite lye from the boiling kettles is passed into the evaporator heated with fresh steam. The steam is then used for cooking the cellulose.

Method for Converting Sodium Sulphide to Sodium Carbonate in the Recovery of Soda Base Sulphite Pulping Liquor. P. S. Billington, G. H. Chidester and C. E. Curran. Paper Trade J. 101, No. 11, 44-46 (Sept. 12, 1935).—The method consists of evaporation and burning of the spent liquors followed by treatment with sodium bicarbonate to convert the sulphide formed in burning to carbonate which may be used for the preparation of fresh cooking liquor. A suggested method of application, together with a theoretical chemical balance of the process, is presented.—A.P.-C.

Yeast from Sulphite Waste Liquor. Anon. Can. Chem. Met. 19, 243-244, 51 (Sept. 1935).—A description of the production of bakers' yeast from sulphite waste liquor by the Heijkenskjold process at the plant of Best Yeast Ltd., Liverpool, N. S.—A.P.-C.

Miscellaneous Digesting Processes

Manufacture of Pulp and Halfstuff. Hofasto A.-G. Brit. pat. 431,542, Sept. 12, 1934.—Groundwood, or the coarse material which accumulates during its manufacture or screening, is washed until free from fine fibres, fibre fragments, and fibre mucilage, and then subjected to the usual chemical treatment.—A. P.-C.

Process for Pulping Straws. A. G. Für Halb-Zellstoff-Industries. Fr. pat. 782,378.—Straw is subjected to a mech. treatment, *e.g.*, in a hammer mill, which breaks it up into pieces about 10 mm. long, and is treated for about 4 hours at about 80° C. with 4 to 5 per cent of lime on the weight of the straw, in the form of a 10 per cent milk of lime.—A.P.-C.

Miscellaneous

Routine and Research in the Paper Mill. James Strachan. Paper Maker & Brit. Paper Trade J. 89, No. 6: TS81-82 (June, 1935).—A brief discussion of the function and importance of routine and research work in the paper mill.—A.P.-C.

Wood Handling and Preparing. Howard Kennedy. Pulp Paper Can. 36: 428-430 (Aug., 1935).—A descrip-

tion of the process followed and equipment used at the plant of the E. B. Eddy Co., Hull, Que., from the arrival of the logs at the foot of the jackladder until reclaimed from the wood pile and delivered to the wood room, together with a discussion of the intensity of wood cleaning necessary and the methods by which this necessary intensity of cleaning should be ascertained.—A.P.-C.

Opacity of Paper. Papier-Ztg. 60, No. 50:867-868 (June 22, 1935).—A review of the principles upon which the opacity of paper is based and means for increasing this property.—C.J.W.

The Formation of Paper on the Fourdrinier Wire. Zellstoff Papier 15, No. 5: 196-198 (May, 1935).—The influence of shake, size and other ingredients, and stock characteristics on the formation of the sheet on the wire are briefly discussed.—J.F.O.

Some Paper Destroying Fungi. A. Sartory, R. Sartory, J. Meyer and H. Baumli. Papier 38: 529-542 (June, 1935).—A detailed report is given on a quantitative study of the cellulolytic action of *Cladosporium herbarum* var. *Cellulosae* (Pers); *Aspergillus fumigatus*, var. *Cellulosae* (Hopf); *Fusarium coereuleum* (Lib.) Sacc.; *Actinomyces cellulosae* Krainsky, and *Monilia cellulosophaga* n.sp., actually isolated from deteriorated commercial paper. The microscopical characteristics of these various fungi when grown on pure cellulose are described and illustrated. The three principal stages in the manufacture of paper during which contamination with celluloytic organisms is liable to occur are: (1) use of infected size or glue, (2) washing bleached pulps with polluted water, (3) drying sized or moistened paper by intense aeration without disinfecting the air. (1) can be overcome by addition of a suitable antiseptic to the size or glue, the following mixture being recommended as giving best results: mercuric chloride 0.02%, vuzine (hydrocupreine derivative) 0.02%, silicofluoride 0.05%, sunoxol 0.05%; danger from (2) is minimized by efficient filtration and verdunization of the wash water; as to (3), dangerous celluloytic organisms are not generally present to any extent in damp air.—A.P.-C.

Chemical Residues in Paper. James Strachan. Paper Maker & Brit. Paper Trade J. 89, No. 5: TS65-66 (May, 1935).—The origin and effect of some of the more important chemical impurities in paper (metallic oxides, sulphur, chlorine, acid) are briefly discussed. Owing to the large specific surface of cellulose, due to its porous and colloidal nature, such residues and much more active in paper than in a solution of similar concentration. —A.P.-C.

Expansion and Treatment of Offset Papers. C. G. Weber. Paper Mill 58, No. 29: 16-20 (July 20, 1935).—A report of the results of the investigations carried out by the U. S. Bureau of Standards into the causes of misregister troubles with offset papers. It is suggested that most of the troubles encountered at present might possibly be avoided if the manufacturer could furnish paper with a moisture content about 0.5% above that corresponding to equilibirum with the relative humidity in the press room.—A.P.-C.

The Internal Structure of Paper. A. J. Bailey. Paper Trade J. 101, No. 3: 40-42 (July 18, 1935).—A discussion of the structure of paper as revealed by microscopical examination of thin cross sections of various types of papers, illustrated by means of 9 microphotographs.—A.P.-C.

Relation of Paper Properties to Register in Offset Lithography. Charles G. Weber. Paper Trade J. 100, No. 26: 34-36 (June 27, 1935); Technical Association Papers 18: 430-432 (1935).—With chemical wood pulp papers best register is obtained when the machine direction coefficient of expansion is lowest. This desirable property is obtained by manufacturing the paper with the minimum of beating and jordaning essential for the required strength and surface quality. For all-rag papers, large directional difference or pronounced grain is apparently not indicative of low expansion and good register.—A.P.-C.

Paper Grain: Its Importance in Book Production. Vincent S. Smith. Paper Industry 17: 252 (July, 1935).—A brief discussion.—A.P.-C.

Receptivity of Paper for Ink in Printing. W. T. Diefenbach. Paper Mill 58, no. 24: 13-17 (June 15, 1935).—A discussion of the necessity of adapting ink to the nature of the material to be printed and to the printing process, with a plea for closer co-operation of the machinery manufacturers and of the makers to the materials on which the printing is to be applied with the ink manufacturer.—A.P.-C.

What the Printing Process Demands of Paper. Julius Bekk. Paper Maker & Brit. Paper Trade J. 89, No. 5: TS71-78 No. 6: TS88-93 (May, June, 1935).—An enumeration and discussion of the more important properties and functions of paper from the printing standpoint, together with a description of the design and application of the author's instruments for evaluating smoothness, softness resistance to picking, power of absorption, power of pigmentation and strike-through, dusting, permeability and abrasive constituents in the paper surface.—A.P.-C.

Relation of Ink to the Preservation of Written Records. E. W. Zimmerman, C. G. Weber and A. E. Kimberly. J. Res. Nat. Bur. Standards 14: 463-468 (1935).—Accelerated aging tests (heating for 72 hrs. at 100°C.) indicates that all the common types of ink accelerate the deterioration of paper, the effect being most marked with papers suitable for permanent records. The only ink which has a negligible effect on paper is that of Silbermann and Ozorovitz, which has a base of ammonium oxyferrigallate; this ink has a good writing quality, is stable, and is only mildly corrosive to steel pens.—A.P.-C.

Budgeting the Pulp Industry. Christian Schlingmann. Zellstoff Papier 15, No. 3: 104-06; No. 4: 162-63 (March, April, 1935).—A budget system for the pulp industry is explained and described by means of charts or forms.—J.F.O.

Concerning the Question of the Calculation of an Installation for the Removal of Air. Richard Nothlichs. Wochbl. Papierfabr. 66, No. 13: 243-46 (March 30, 1935). —Tables are first given for moisture carrying capacity of air at varying temperatures, the amount of heat removed with the moisture laden air, and other necessary tables for the calculation of an installation for the removal of vapors. In conclusion, the advantages of such an installation are cited, for example, the possibility for introducing the drying air at the desired places and in the desired quantities and the freedom from seasonal weather variations.—J.F.O.

Device for the Cleaning of Industrial Waste Waters, Especially That from Pulp, Paper, Board, Ground Wood and Related Industries. Friedrich Dettelbach, Zwickau. Ger. pat. 612, 673 (June 23, 1931).—The invention consists of a cone settling tank, the stem of which extends into another container with a moving fourdrinier wire for the bottom which is tilted at an angle. The stock formed on the wire leaves through a slit and is conveyed to press rolls.—J.F.O.

Utilization of "White Water" in Paper Factories. Manuel Carceller Rodriguez. Riv. ing. ind. (Madrid) 6:199-202 (1935); C. A. 29:6424.—A review, with special reference to use of chloramine as a disinfectant.—C.J.W.

A Contribution to the Mechanism of Bleaching*

By Friedrich Emil Brauns[1]

Abstract

The presence of lignin of one hydroxyl group (either enolic or phenolic in character) and capable of methylation with diazomethane has been known for some time.

The function of this particular group in relation to the mechanism of bleaching has been investigated. Unbleached sulphite and kraft pulps are improved in brightness by methylation of this group in the lignin present in the pulp. In the case of the unbleached sulphite, the brightness as determined on the General Electric reflection meter is raised from 51.1 to 67.8. Diazomethane-methylated unbleached sulphite pulp no longer gives the characteristic color and stain reactions of unbleached pulp. This hydroxyl group would therefore appear to have some relation to the ordinary color and staining reactions of lignin and lignified pulps.

When bleached with hypochlorite, the rate of reaction is materially lowered and the total amount of required chlorine consumed is considerably less than is the case with the unbleached unmethylated pulp. Somewhat similar behavior is noted with unbleached kraft pulp. This hydroxyl group would thus appear to play an important role in the bleaching reaction.

Additional work is projected to determine further the bleaching mechanism.

The actual mechanism of the bleaching process is still a matter of conjecture in spite of the large amount of research and development in the field. Without doubt a number of reactions proceed simultaneously, although the main change involves the modification of lignin present in the unbleached pulp by the bleaching reagent so as to render it soluble in aqueous alkaline solutions. As an explanation for this, the lignin is said to be either oxidized or chlorinated or both.

The mechanism of this principal reaction is not at all clear. Knowledge is lacking as to the nature of the reactants and their mode of combination. Not all unbleached pulps bleach at the same rate, for variations in pulping processes result in variations in ease of lignin removal. Sulphite pulp bleaches readily, possibly because the lignin is already in a partially modified condition as a result of the presence of sulphonic acid radicals; unbleached kraft is difficult to bleach, in part because of the stability of the sulphur derivatives of phlobotannins. In the case of the former, the chlorinated lignin derivatives are apparently easily soluble, while in the latter preliminary oxidation with gaseous chlorine followed by an alkaline extraction is necessary before bleaching with hypochlorite is possible.

A complete understanding of the mechanism of bleaching will not be reached until the structure of lignin has been experimentally established. The direction may be indicated, however, by studying the way in which certain groups in lignin behave.

Considerable work has been carried out within recent years which shows in lignin one phenolic or enolic hydroxyl of a slightly acid character, capable of methylation by diazomethane in contrast to the other hydroxyls which require alkali and dimethyl sulphate for their methylation. This was first noted by Freudenberg and Urban *(1)* in connection with the lignin of spruce wood. Also Fuchs and Horn *(2)* observed that the action of diazomethane on air dried spruce wood left the woody structure unchanged, although the material became almost colorless and would not respond to a lignin reaction. At the same time, the lignin in the wood increased its methoxyl content to 19.5 per cent and the cellulose was methylated to the extent of 7.8 per cent. The methylated lignin, isolated by hydrolysis of the carbohydrates with concentrated hydrochloric acid reacts only with difficulty with bromine in carbon tetrachloride. Fuchs and Horn further methylated cotton and filter paper, using diazomethane, to an extent of about 5 per cent while under similar conditions glucose is not methylated. The methylation of carbohydrates with diazomethane was first carried out by L. Schmid *(3)* who could methylate starch up to 21 per cent MeO. As shown by our experiments the methylation of carbohydrates with diazomethane depends upon the presence of water. When for instance oven-dried potato starch is treated with an anhydrous diazomethane solution no marked methylation occurs but in the presence of a few drops of water the starch can be methylated in one methylation experiment up to 23.4 per cent.

In this connection Hibbert and Brauns *(4)* noted that Willstatter and Freudenberg lignin and other lignin derivatives become brighter in color on methylation. These authors have utilized the reaction between lignin compounds and diazomethane in a recent series of articles as a means for differentiating hydroxyls in lignin and lignin derivatives.

In the light of these reactions, it seemed worth while to determine whether the one hydroxyl group reacting with diazomethane plays any part, as such, in the bleaching reaction. To do this the lignin in unbleached dried pulp was first methylated with diazomethane to protect it from attack through reactions involving tautomeric shifts with subsequent addition of halogen or elimination of halogen acid. This diazomethane-methylated pulp was then subjected to the bleaching action of an alkaline hypochlorite solution.

The results indicate that this hydroxyl plays a very important part in the bleaching reaction, for diazomethane-methylated unbleached pulp reacts with the bleach solution very slowly, and then only after a portion of the methoxyl groups have been eliminated. In addition, the diazomethane-methylated unbleached pulp with essentially the same lignin content, has a brightness very much greater than the original unbleached pulp—with sulphite pulp, the methylated unbleached pulp is almost as bright as the bleached pulp, which might be suspected from the above statement of Fuchs and Horn that diazomethane-methylated wood is almost colorless. This diazomethane-methylated unbleached pulp no longer responds to the characteristic color tests for unbleached pulp. Indeed, if such a product were to be manufactured commercially, a new chapter on fiber stains would need to be written.

Experimental Work

Unbleached sulphite and unbleached kraft pulps were selected as raw materials for the treatment with diazomethane and its subsequent bleaching. They have the following characteristics:

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Unbleached sulphite pulp:	
Brightness	55.6
Permanganate number	21.2
Chlorine number	11.38
Unbleached kraft pulp:	
Brightness	19.2
Permanganate number	21.8
Chlorine number	11.77

The pulps were first extracted with a methanol-ether mixture to remove resins and resin acid. A peculiar behavior in regard to brightness was noted; while the brightness of the kraft pulp was unchanged on extraction (as might be expected), the brightness of the sulphite fell from 55.6 to 51.1.

Experiments with the Unbleached Sulphite Pulp

The sulphite pulp after extraction with methanol-ether, was boiled with distilled water for fifteen minutes in order to remove adsorbed organic solvent and then dried to constant weight.

Fifteen grams of this material were methylated by diazomethane in anhydrous methanol suspension with three lots of diazomethane, prepared from fifty grams of nitrosomethyl urea.[2] After standing for two days at 10 to 15 deg. C, the methanol suspension was still slightly yellow due to the presence of unchanged diazomethane. This excess was destroyed with a few drops of acetic acid and the pulp was then filtered, washed with water and dried.

This methylated sulphite pulp has a permanganate number of 17.1 and a chlorine number of 8.76. It should be noted that the change in permanganate number is not the result of the loss in lignin or other similar soluble material for the pulp has been thoroughly extracted with methanol-ether prior to methylation. A check-up showed that the percentage of methanol soluble material under the conditions of the experiment was only 0.27. A lignin determination on the residue showed but 1.88 per cent present in contrast with the 3.6 per cent in the original pulp. The value, however, is not analytically significant because of the difficulty in removing the finely divided acid-insoluble material formed in the lignin determination with the methylated product.

A remarkable change in the appearance of the pulp is noted, for the brightness value, obtained on the General Electric reflection meter has increased from 51.1 to 67.8. This color change is due not to removal of lignified materials, as is the case with the bleach reaction, but rather results from the methylation of the weakly acid hydroxyl of the lignin, the methylated lignin remaining in large part in the pulp. The methylated pulp containing better than 1.88 per cent lignin no longer gives the lignin color reaction with phloroglucinol-hydrochloric acid, characteristic of unbleached pulps and the behavior with respect to fiber stains is likewise unpredictable.

A check experiment was carried on by methylating the pulp in a suspension in ether in which nearly all known lignin derivatives are insoluble. The permanganate number, chlorine number and brightness check closely with those in the first experiment being 17.4, 8.85, 67.3 respectively in comparison to 17.1, 8.76 and 67.8.

The methoxyl content of the methylated sulphite pulp has increased from 1.13 to 3.0 per cent; the reaction with diazomethane has thus introduced an additional 1.87 per cent methoxyl. A similar increase was noted in the methoxylation carried on in ether.

The methoxyl determinations were carried out according to the method of Vieböck and Schwappach *(5)* in a semi-micro scale. Using a relatively large sample of the pulp, 0.100 grams and 0.05 N sodium thiosulphate solution, the results are very accurate and easily reproducible. Since this method takes altogether approximately one hour, it is suggested that a modification of the method be considered for use as the TAPPI standard method for the determination of the methoxyl content of pulp. Such a modification requiring much less sample, less chemical, and a cheaper apparatus than the present TAPPI method is being developed at the present time as a standard method of The Institute of Paper Chemistry.

Bleaching experiments with the unmethylated and methylated sulphite pulps were carried out. In the first test, chlorine as a calcium hypochlorite solution was added in three stages, the pulp being washed with water between each addition of the bleach liquor. This probably does not permit a true relationship between chlorine used and chlorine number, for the washing undoubtedly removes soluble lignin residues capable of further combination with chlorine, if such were allowed to run to completion.

Although the same amount of bleach liquor is added to equal amounts of unmethylated and methylated pulp, t chlorine in the unmethylated pulp is used up at a much faster rate than in the methylated pulp. The increase in brightness in the unmethylated pulp is relatively much greater than with the methylated pulp because of the high value of the original methylated pulp. Of interest is the fact that a brightness of 80 is obtained with 25 to 30 per cent less chlorine consumption than is the case with the unmethylated pulp. The fact that only 75 per cent of the chlorine called for by the chlorine number is consumed is explained by the removal of soluble chlorine consuming residues through the washing between chlorinations. These data are given in Table I.

TABLE I

THE ACTION OF BLEACH LIQUOR ON UNMETHYLATED AND METHYLATED UNBLEACHED SULPHITE PULPS, WASHING BETWEEN EACH ADDITION OF BLEACH

	Unmethylated Pulp			Methylated Pulp			
Chlorine Addition	Per cent Cl Consumption on Cl No. 11.07	Time in Hours	Brightness 51.1	Per cent Cl Consumption on Cl No. 8.7	Per cent Cl Consumption on Cl No. 11.07	Time in Hours	Brightness 67.78
1	58.2	6	58.3	73.1	58.4	<24	68.3
2	75.8	<24	77.9	83.5	66.8	<24	80.2
3	85.8	<24	79.5	94.0	75.2	<24	81.0

In the next experiment with these pulps the chlorine was added to the two pulps in the ratio of their chlorine numbers, namely 1.25-1.00, the mother liquor being left in the mixture each time. The results are listed in Table II.

TABLE II

THE ACTION OF BLEACH LIQUOR ON METHYLATED AND UNMETHYLATED UNBLEACHED SULPHITE PULPS, WITHOUT WASHING DURING CHLORINATION

	Unmethylated Pulp			Methylated Pulp			
Chlorine Addition	Per cent Cl Consumption on Cl No. 11.07	Time in Hours	Brightness 51.1	Per cent Cl Consumption on Cl No. 8.7	Time in Hours	Brightness 67.7	
1	59	6	56.6	60.3	<24	69.6	
2	23.6	7	72.8	23.6	<24	76.6	
3	11.8	9	75.0	11.8	20	77.0	
4	5.9	<24	77.8				

The data of particular interest are those referring to the difference in rate with which the chlorine is taken up between the unmethylated and methylated. On examining the figures somewhat more closely, it is apparent that while 60 per cent of the chlorine is being taken up by the methylated pulp, only a slight increase in brightness is observed. This may be due either to a very slow demethoxylation of the methylated lignin followed by chlorination and oxidation of the demethoxylated residue which would use up an unexpected amount of chlorine or to the slow formation of

[2] For further reference to this method for the preparation of diazomethane see *Angewandte. Chemie* 43, 444-446 (1930).

partially chlorinated insoluble methylated lignin residues of essentially the same color as the methylated lignin. Whatever is the explanation, the total per cent chlorine consumption with the methylated pulp calculated on the chlorine requirement is about 30 per cent less than that of the unmethylated pulp and the time required is in excess of 68 hours as compared with somewhat more than 46 hours with the unmethylated pulp.

In the third experiment the unmethylated and the methylated sulphite pulp prepared in ether solution, was bleached under similar conditions as in the second experiment, but in order to obtain more analytical data the chlorine was added in smaller portions. The results are shown in Fig. 1, curve I, the figures at the various points give the hours used for the exhaustion of the chlorine added.

It can be seen that in both cases the brightness first decreases slightly and then increases nearly in the same ratio, and as in the former experiments, the chlorine consumption of the methylated pulp takes a much longer time while the chlorine consumed by the methylated pulp for the same brightness is less than is taken up by the unmethylated pulp. The methoxyl content of the methylated pulp declines continuously with progress of bleaching but is still about 1.9 per cent at a brightness of 75.

These experiments prove the correctness of the assumption outlined earlier, that a free hydroxyl group capable of methylation with diazomethane plays an important role in the bleaching of sulphite pulp not only in regard to the speed of the bleaching but also in the amount of chlorine consumed. For a quick bleaching, this free hydroxyl group is essential, at the same time, however, it brings about a higher consumption of chlorine.

That it is the lignin which has been methylated in the unbleached sulphite pulp is proven by the methoxyl determination of the lignin isolated in the lignin estimation of the pulps before and after methylation, for the lignin isolated from the original pulp had a methoxyl content of 12.7 per cent while the lignin of the methylated pulp contained 15.3 per cent methoxyl. The methoxyl content of 12.7 per cent appears to be rather low, but there is no doubt that a part of the methoxyl has been eliminated either during the sulphite cooking process or in the lignin determination.

TABLE III

Chlorine Addition	Unmethylated Pulps Brightness—19.5. Cl No. 11.8 Per cent Cl on basis of pulp wt. added	Total am't.	Time	Bright-ness	Methylated Pulp Brightness—25.6 Cl No. 9.2. MeO—2.8% Per cent Cl on basis of pulp wt. added	Total am't.	Time hrs.	Bright-ness	MeO
1	5.33	....	50'	16.0	4.17	....	6	20.0	2.13
2 Cl	3.18	8.57	1 hr.	25.9	2.29	6.46	½	26.7	1.87
3 Water	2.11	10.62	2 hr.	45.0	1.51	7.97	1½	33.2	1.56
4	....	....	.....	...	1.76	9.73	6	50.4	1.53
5 Bleach	1.13	11.75	7 hr.	77.9	0.62	10.35	4	77.0	1.51
6 Liquor	0.28	12.03	24 hr.	77.7	0.50	10.85	24	79.1	1.44

Experiments with Unbleached Kraft Pulp

Since alkaline lignin shows a completely different behavior than all other lignin derivatives *(4)*, the effect of methylation of kraft pulp with diazomethane and its resulting influence on bleaching is a matter of interest.

The kraft pulp used had a lignin content of 4.82 per cent, the latter having a methoxyl content of 12.5 per cent. The methoxyl content of the pulp itself was 0.9 per cent which suggests that two thirds of the methoxyls of the original pulp are isolated with the lignin. When this pulp is treated with diazomethane in an ether suspension, the methoxyl content increases from 0.9 up to 2.8 per cent, but also the lignin content is found to be 1 per cent higher than before the methylation. This increase is not entirely due to the higher methoxyl content but is related to the possibility that that portion of the lignin soluble in acid under the ordinary conditions of test, has been rendered less soluble or more slowly soluble in the acid. This suggests the possibility of utilizing these reactions in classifying lignin in plants. It is known *(6)* that alkali lignin has more free phenolic or enolic hydroxyl groups which give rise to an easier sulphonation than in the case where these free hydroxyl groups are covered by methoxyl. In spite of the apparently higher lignin content of the methylated kraft pulp its permanganate number is only 17.8 instead of 21.8 before the methylation. The brightness likewise increases from 19.5 to 25.8.

With the unmethylated and the methylated pulp a chlorine hypochlorite multistage bleach was carried out on each pulp. The pulp was first bleached by chlorine water, then extracted with caustic soda solution and given a final bleaching with bleaching liquor.

In Table III the amounts of chlorine, time for its consumption, and the corresponding brightness are listed.

From this table it can be seen that also in this case the brightness first declines with the beginning of the bleaching and also the methoxyl content dropped rapidly at the beginning, but the chlorine consumption on the first stage with the methylated pulp takes about 7 times as long as with the unmethyl-

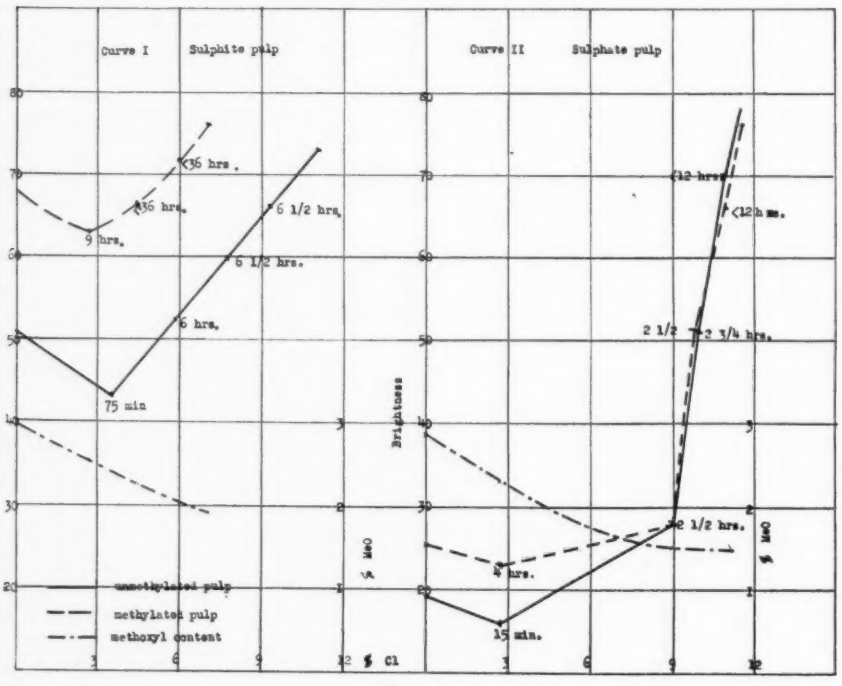

FIG. 1

ated pulp. In the next stages, however, the time decreases rapidly with the decreasing methoxyl content.

In order to obtain more information during the different stages, in the next experiment the first amount of chlorine taken was relatively small, for it could be possible that the first action of chlorine was to split off a larger part of the methoxyl group. If this were so, further behavior of the pulp toward the bleaching agents might be similar to that of the unmethylated pulp. The result can be seen from Fig. 1, curve II. On addition of 2.8 per cent chlorine, the brightness decreases a little in both cases although it takes the methylated pulp 4 hours to use up the chlorine in comparison with only 15 minutes for the original pulp. The methoxyl content decreases at the same time from 2.8 to 2.3 per cent. The consumption of the next lot of chlorine takes the same time for both pulps with a further decrease of the methoxyl content of the methylated pulp and about the same degree of brightness for each product. After this second chlorine addition, the methoxyl content of the methylated pulp dropped to 1.5 per cent and remained at that point until the end of the bleaching. Here the lignin is practically demethylated and it is, therefore, not surprising that bleaching curves fall together from that point on.

Summary

The residual lignin in unbleached sulphite and sulphate (kraft) pulp can be methylated by diazomethane with an increase of the methoxyl content of the lignin of 2.5 and 5 per cent respectively. In both cases a brightening of the pulp takes place and the color reaction with phloroglucinol-HCl fails to appear.

Comparative bleaching experiments with the unmethylated and the methylated pulps indicate that the chlorine consumption takes much longer with both methylated pulps than with the original pulps.

In the case of the methylated sulphite pulp the methoxyl content decreases nearly in the same ratio as the lignin is removed and the same brightness is obtained with about 30 per cent less chlorine than is the case with the bleaching of the original sulphite pulp.

In the case of the methylated kraft pulp the methoxyl content decreases at the beginning of the bleach very rapidly. After the lignin is demethoxylated the bleaching curves of methylated and unmethylated pulps fall together, the pulps from that point consuming an equal amount of bleaching reagent.

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The Essential Qualifications and Training of a Microscopist for the Pulp and Paper Industry*

by John H. Graff[1]

Abstract

The following paper has been based upon the experience of the author in microscopic work in the pulp and paper industry and his more recent experience in teaching courses in fiber microscopy and photo-micrography at The Institute of Paper Chemistry.

Some twelve fields of work in the pulp and paper mills are shown to offer the opportunity for the trained microscopist to be of service. The qualifications for such technicians have been considered in some detail. The microscopist must be thoroughly familiar with the optics of the microscope, with microscopic accessories and their proper uses and with the fundamentals of photomicrography. He must be absolutely free from any form of color blindness. He needs sound training in wood technology and fiber morphology and must be able to apply the different methods of microtechnique and standard methods of procedure to these fields. In order to demonstrate the validity of his conclusions, he must be able to organize his results in satisfactory graphs based upon sound statistical tabulations. These coupled with the proper photomicrographs are of great benefit to the executives of his company and to their sales representatives.

Finally, he should be able to select and train laboratory assistants to aid him in carrying on the various routines such as may be delegated.

The method employed by The Institute of Paper Chemistry for providing training in fiber microscopy and photomicrography is outlined.

Although the heads of the various pulp and paper mill laboratories unquestionably realize the importance and value of microscopic method of analysis and investigation, many mills lack the services of trained skilled microscopists. This is due in part to the fact that the improvement and expansion of microtechniques has had a long and somewhat erratic course and until recently, many of the applications have been so scanty and imperfect as to be open to question. As a result, the absolutely essential microscopic work in the mill has been left to the most capable individual on the staff regardless of his possible lack of fundamental training in the field.

To make the microscope and microscopic equipment and technique valuable assets in the mill, the work should be handled by one making it his speciality. Such a man must have had not only the proper training but must also fulfill certain necessary qualifications.

In order to understand why these qualifications are essential, a survey of microscopic work of value in the mills is highly desirable. Although the relative importance of the different types of microscopic work will vary in the different mills, the most common applications are as follows:

1. Fiber analysis of paper furnishes.
2. The determination of bleachability, degree of bleaching, and the effect of various other chemical treatments based on variations in certain staining reactions.

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1. Member TAPPI, Research Associate and Instructor in Fiber Microscopy. The Institute of Paper Chemistry, Appleton, Wis.

3. Speck analysis.
4. Fiber length studies.
5. Particle size of such materials as fillers, etc.
6. Comparative beating studies.
7. Identification of types and methods of sizing and a study of the deposit of precipitated size on the fibers.
8. The relation between the surface texture and cross section of paper and the printing, typing, and writing characteristics.
9. The relation between the different types of calendering and paper finishing and the surface texture of paper.
10. Occasional problems in metallography, textile microscopy, or bacteriology.
11. Photomicrographic work.
12. Special microscopic research.

A glance at the above list will indicate the breadth of service to be rendered by the trained microscopist. In order to carry on, he must first of all understand the use of the microscope and its accessories. The microscopist and his superiors must realize that the microscope is not a self sufficient instrument but that it is an accessory to the eye and to the intelligence of the investigator. In order that comparable and reliable data be obtained, it is important that the microscopist know the limits of the various types of microscopic equipment, the proper use of different methods of illumination, and the different methods of microtechnique.

He should in the first place be thoroughly familiar with elementary optical principles. For example he must know what occurs when using lenses with spherical and chromatic aberration and must understand the relation between magnifying power, working distance, depth of focus, numerical aperture and the resolving power of microscopic objectives. He must be familiar with the types of oculars and the proper place and way of using them in combination with different objectives. He must, likewise, know the uses and limits of the different types of condensers and dark field systems and above all the relationship between the various methods of microscopic illumination and their use to the best advantage with the problem under consideration.

All of this is fundamental and would seem unnecessary to stress but unfortunately many technical graduates have but a meager knowledge of microscopes and often draw erroneous conclusions, as certain technical papers have proven, because the investigator has not been sufficiently acquainted with his microscope to use it to the best advantage. This lack of knowledge in regard to the fundamental principles of microscopy often results in the purchase by the mill of expensive but irrelevant microscopic equipment.

The special knowledge and qualifications for the above types of microscopic work in the pulp and paper mill are briefly discussed in the following paragraphs.

1. Fiber Analysis

By far the most common form of microscopic work carried on in the paper mill is the analysis of fibers. Little consideration is given in most mills to the qualifications of a good fiber analyst, although experience has shown that relatively few, even including those with a thorough microscopic training, become dependable workers.

In addition to the basic microscopic knowledge, the successful fiber analyst should be absolutely free from color blindness and highly color sensitive. This is essential in order to permit the recognition of the slightest variations in color reactions with the different stains used. He should know something of the reasons behind the various stain reactions. A good fiber analyst needs an adequate working knowledge of wood technology and fiber morphology, so as to differentiate between soft woods and hard woods by stain reactions, and the various types of wood, bast, grass, and seed fibers by morphological characteristics. Finally the fiber analyst must have an analytical mind and be able to recognize rapidly the possible significance of unusual variations.

As a preliminary requisite to an elementary knowledge of fiber differentiation, the fiber analyst must first of all study all of the various types of paper fibers under the microscope in connection with the most valuable stains so as to familiarize himself with the stain reactions of these various fibers. If this study is adequate it will include fibers from all possible sources, cooked and bleached under different degrees and by different methods, and followed by the various types of chemical treatment. Each type of fiber must be studied singly and the stain reactions understood and memorized. After this has been done the analyst should make up standard slides of a variety of fibers and familiarize himself with variations in the color reactions of fibers in juxtaposition on the slides. In this connection it should be noted that there are over 50 types of fibers treated in various manners to be found in papers on the American market. It can be readily seen that a tremendous amount of preliminary training is required if the microscopist is to arrive at a correct analytical interpretation of the various fibers found in a paper furnish.

In addition to making the correct qualitative analyses, the analyst should be able to calculate with a reasonable degree of accuracy the quantitative proportion of the fibers in the paper by computing the relative amounts of each type of fiber and applying to these values the correct weight factors for these fiber types.

2. Cooking and Bleaching

Valuable observations can be drawn by a comparison of the differences in the color reactions of certain stains with pulps which have had varying degrees of cooking, bleaching, and other chemical treatment. Here again a high degree of color sensitivity is of utmost importance and proficiency can only result from constant application to the work.

From these observations, a trained microscopist should be able to tell the relative degree and uniformity to which a pulp has been cooked. Furthermore it should be possible for him to tell whether the fibers have been given an acid or an alkaline bleach and to what degree the bleaching has been carried. Often a skilled microscopist is able to detect variations in the physical characteristics of fibers as the result of different chemical treatments.

3. Speck Analysis

Speck analysis is comprised of two factors. In the first place it involves the uniform preparation of speck sheets to be used in determining the number of specks per gram in pulp or paper. The second relates to the proper identification of the specks. The first part of the work may or may not be the duty of the microscopist, but regardless of this he should be able to make a systematic analysis of the specks in pulp and paper. Not only must he proceed according to a standard method but he must likewise be acquainted with the possible types of specks and their identifying reagents and with a systematic method for employing such reagents. In this connection it also is well to

bring out that the ability to differentiate between resins and gums and between the types of resin specks will be of enormous value in helping to eliminate such specks which are so prevalent in mills using wood fibers.

4. Fiber Measurement

The measurement of fiber length and sometimes of fiber width to obtain the "average fiber length" of a pulp is not the only valuable application of these measurements in the pulp and paper mills. The effect and relative value of various forms of fractionation and fiber classification, the effects of different types and lengths of beating and the relative shrinkage or swelling of fibers when given various types of chemical treatment may furnish data of real value in paper mill operation. This type of work is seldom performed in any mill, probably because of the lack of trained personnel.

To make correct fiber length determination the microscopist must of course be familiar with the fundamental principles of micrometry. He must also know the standard methods of preparing the samples, and have the patience and technical skill for carrying on the work. He must realize that an average fiber length means little or nothing, even if duplicate determinations can be made with an accuracy of plus or minus 0.05 mm. He must be able in addition to determine how best to divide the results according to the percentage of short, medium, and long fibers. This should be done not only by the per cent according to number, but also by per cent according to weight. In many instances it will be necessary for him to make frequency distribution curves of the fiber lengths.

5. Particle Size

A knowledge of the fundamental principles of micrometry are likewise essential if the microscopist is to carry on particle size determinations. He must be able to select the proper dispersing material for use with the substance being measured and must be acquainted with the methods of mechanical dispersion. He needs to be able to select for the problem at hand the most satisfactory combinations of magnification, depth of focus, and lens resolving power, the proper type of illumination, the most efficient condensing system, and the best ordinary filters or a proper choice between Rhineberg filters or dark field illumination. He must, of course, not be satisfied with the determination of the average particle size of a sample, but must be able to express this in terms of uniformity and covering power of the material.

6. Beating

Some idea of the degree of beating, that is, the relative proportion of long and short fibers, can be had by fiber length determinations; but proper information concerning the amounts of fibrillae and "hydrate" formed during the stages of beating can also be had if the microscopist knows how to prepare standard slides for this purpose and above all knows the technique of using the right optics to get the proper form of transmitted light or dark field illumination. This type of work will go a long way toward the clearing up of more or less hazy conceptions of the results to be obtained by the types of beating and beating equipment in use in many mills.

7. Surface Texture and Cross-Sections

Surface textures of papers can be examined comparatively and even measured if the microscopist knows how to apply and to differentiate between oblique, annular oblique, grazing, transmitted, and reflected light and if he fully understands the importance of the angle of incidence in these types of illumination.

To prepare the proper cross-sections of papers, the microscopist must be familiar with imbedding materials and must know when and how to use one or the other and the methods of free hand, hand microtome, and regular microtome section cutting; he should know when and how to free the microtome sections from the imbedding material used.

8. Sizing

It is possible to determine the various kinds of sizing used in papers and whether or not a particular paper has been machine or tub sized by applying the different microscopic reagents available for this purpose. Few realize that the relative distribution of all precipitated forms of size on the fibers can be determined if the microscopist knows how to select the right kinds of optics in combination with the proper types of dark field condensers and illumination.

9. Metallographic Work

Occasionally it will be necessary for the pulp and paper microscopist to do some metallographic work. It is not expected that he should be an expert metallurgist, but he should at least be familiar with the principles of preparing different types of metals for microscopic examination and should know the most common etching agents for iron, steel, copper and copper alloys, bearing metals, nickel and nickel alloys, and lead.

10. Presentation of Data

It is not enough for the microscopist to be able to perform these different types of work in a satisfactory manner. He must also be able to report his findings graphically and with illuminating statistical data. In a good many instances photomicrographs must also be made as they will help to carry the contents of his report to the mill executive and to the sales department; the latter will often find use for these in sales promotion.

Unfortunately many a good technician does not have the knack of making simple and illuminating charts and statistical tabulations; nor do most of the photomicrographs used for illustrating reports or technical publications show what the microscopist intended to demonstrate because of lack of necessary knowledge of the fundamental principles of photomicrography.

To make illuminating photomicrographs, the microscopist must remember that the photographic image is only one of many aspects of the material under observation, any one of which is at his disposal by the shift of the field, a touch of the fine adjustment, or a variation of optics and character of the illumination. The image on the ground glass of the camera must be just as perfect as that demanded for visual observation; it is manifest, therefore, that the microscopist must not only be familiar with microscopic technique but must also be fully familiar with equipment and special procedures peculiar to photomicrography.

The microscopist must know how to adjust, align, and center his equipment. He must understand the differences between color-blind, orthochromatic, and panchromatic materials, and must know what can be done with slow and fast, contrasty, and soft photographic emulsions. He should be familiar with the principles of exposure, development, and density and contrast control.

The principles of color absorption and color filters should be fully understood by the microscopist, in order that he may be able to translate the variations in color contrast

into the proper tone contrast by use of the correct monochromatic light, all of this in addition to a complete familiarity with all of the forms of photographic technique and manipulation.

Besides being acquainted with and experienced in all of the forms of microscopic manipulation and technique of photomicrography, the well rounded microscopist will be familiar with all of the standardized new methods, so that all errors due to sampling, improper technique, and the personal element can be eliminated as much as possible. In doing this, he must be sure that the methods not only hold for materials in his own plant but also for the same general type of materials from other sources. Too often methods of technique and reagents are found in the literature which hold true for products and conditions in a certain mill, but show entirely different results if the same method is used on a similar product from another source.

11. Microscopic Research

Very often some executive, or a member of the technical staff or sales department may bring to the analyst problems which require some particular investigation. Upon first examination these problems may seem outside the field of ordinary microscopy and photomicrography, but if the microscopist has had the necessary fundamental training and has some ingenuity and inventiveness, he may not only be able to solve such problems but also be able to develop new methods of technique and thereby increase his value to the company. He must also have the faculty of gaining the good will of the men in the mill, must understand their problems, and must always endeavor to find ways and means of being of service to them.

It is not enough that the microscopist be a fully trained first class workman in his field. If these were his only attributes, he would have to spend his entire time on one or two particular forms of routine microscopic work and would have no time to give his company valuable service in the other forms of microtechnique. It would be too costly for a company to hire a staff of fully trained microscopists for all forms of microscopic analyses and information. The microscopist must therefore be able to train laboratory assistants to perform properly standardized routine analyses. This is economically sound, and if the right type of assistants are chosen, and if the microscopist in charge knows how to train assistants to do well one or probably at the utmost two standard routines, he not only will be able to spread the microscopic services rendered over a larger number of daily problems, but he will also be able to do fundamental microscopic research work.

Microscopy, as shown by this article, can be applied to a large number of problems in pulp and paper mills, and if the executives in the plants could be sure of getting men with the proper training and the necessary qualifications, there would indeed be few plants which could not profitably employ a full time microscopist.

It would of course be exceptional to find any one who fulfilled all of the qualifications mentioned in this paper, for even the most serious-minded and successful workers in this field would be highly flattered if it were to be said that they came within such a classification.

The enumeration of these qualifications does, however, set up a standard for the microscopist in the pulp and paper industry. It is with this standard in mind that The Institute of Paper Chemistry has built up its work in fiber microscopy and photomicrography.

As a part of the regular course of study at the Institute, all students take work in wood technology so as to familiarize them with the various elements in woods, bast fibers, grasses, and seed hairs. Particular stress is put upon the differentiation of wood types and species, microscopically and macroscopically. This is followed by extensive courses in optics, fiber microscopy and photomicrography. In the first the fundamental bases for optical systems are developed and applied. The second course covers in a complete and systematic manner the identification of the various types of pulp fibers and their qualitative and quantitative estimation in mixtures. During the course the individual student receives two standard slides from each of eighty different pulps, differing in treatment as well as in fiber furnish, thirty-five different known mixtures of fibers, and twenty-five known mixtures for preliminary qualitative analysis. As a final test each man analyzes fourteen different unknown mixtures quantitatively and ten samples of commercial paper for qualitative as well as quantitative estimation. In this connection it should be stated that absence of color blindness is one of the primary requisites for admission to the Institute of Paper Chemistry.

On the completion of this course, they take a comprehensive course in the principles of photography and photomicrography. In this they are first given the general principles of photography. These relate to the use of lenses, types of emulsions, and film and plate development. Special work is presented in the field of color photography, phototopography, and the photography of commercial subjects. This ground work leads into fine work in photomicrography which involves a study of the optical systems of the microscope as they apply to photography by transmitted light and by dark field and vertical illumination. Additional experiments are carried on with polarized light and with direct color photography.

Summary

1. The various types of service which may be rendered to a pulp and paper mill by a thoroughly trained microscopist have been outlined.

2. The types of technique necessary to perform these services have been described.

3. It has been pointed out that not all technical men are qualified to carry on microscopic work.

4. The training in fiber microscopy and photomicrography as carried on at the Institute of Paper Chemistry in preparing capable technicians has been described.

TAPPI Soap Wrap Committee Progress

T. Linsey Crossley of Toronto, Chairman of the Soap Wrap Subcommittee of the Technical Association of the Pulp and Paper Industry has just reported on the progress being made by that committee, which is part of the TAPPI Paper Use Requirements Committee.

At the suggestion of the committee, a student of the University of Toronto is studying the identity of the tannin-like substances that are discolored with soda.

The extraction method recently reported has been modified and to date has exhibited no serious flaws.

The committee has recently had brought to its attention the question of the use of kraft, not because it is used much as a wrapper, but because of its use in containers and as separators. In these cases the staining is not on the kraft but owing to sweating and condensation causes stains on the wrappers by reason of extractive matters. Spotting with alkali is not practical here because of the color so the water extraction method is used.

An instance of paper required to be alkali-proof is that used in labeling on aluminum foil where the paste used some times contains up to 4 per cent of caustic soda.

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De Manduit Paper Corp., *California,* Havre, 175 cs.; Standard Products Corp., *California,* Havre, 27 cs.; Champagne Paper Corp., *Ile de France,* Havre, 798 cs.

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Treetex Corp., *Siljestad,* Sandviken, 2,340 bdls.

NEWSPRINT

Jay Madden Corp., *Pr. Harding,* Hamburg, 94 rolls; Gilman Paper Co., *Siljestad,* Norrkoeping, 527 rolls; Brooklyn Times, *Siljestad,* Norrkoeping, 318 rolls; International Paper Co., *Humberarm,* Dalhousie, 2,123 rolls; International Paper Sales Co. Inc., *Humberarm,* Dalhousie, 2,019 rolls; Jay Madden Corp., *Washington,* Hamburg, 298 rolls; Perkins Goodwin & Co., *Hamburg,* Hamburg, 476 rolls.

PRINTING PAPER

Dingelstedt & Co., *Europa,* Bremen, 39 cs.; Senefelder, Inc., *Hamburg,* Hamburg, 21 cs.

WRAPPING PAPER

Jay Madden Corp., *Pr. Harding,* Hamburg, 618 rolls, 11 bls.; ———, *Pennland,* Antwerp, 2 cs.; Keller Dorian Paper Co., *Excalibur,* Marseilles, 2 cs.; Guaranty Trust Co., *Gripsholm,* Gothenburg, 52 rolls; Blauvelt Wiley Paper Manfg. Co., *Gripsholm,* Gothenburg, 53 rolls, 6 bls.; J. P. Heffernan Paper Co., *Cristobal Colon,* Bilbao, 65 bls.

FILTER PAPER

H. Reeve Angel & Co. Inc., *Britannic,* London, 16 cs.

DRAWING PAPER

H. Reeve Angel & Co. Inc., *Britannic,* London, 2 cs.

SURFACE COATED PAPER

C. Happel, *Pr. Harding,* Hamburg, 14 cs.

BASIC PAPER

Dingelstedt & Co., *Europa,* Bremen, 2 cs.

PHOTO PAPER

Medo Photo-Supply Co., *Berengaria,* Southampton, 1 cs.; J. J. Gavin, *Berengaria,* Southampton, 9 cs.

DECALCOMANIA PAPER

B. F. Drankenfeld & Co., *Franconia,* Liverpool, 13 cs. (duplex); B. F. Drakenfeld & Co., *Franconia,* Liverpool, 7 cs. (simplex).

DECALCOMANIAS

Sellers Transportation Co., *Europa,* Bremen, 12 cs.; ———, *Europa,* Bremen, 4 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., *Franconia,* Liverpool, 1 cs.; F. C. Strype, *Franconia,* Liverpool, 8 cs.; Globe Shipping Co., *Europa,* Bremen, 5 cs.

WRITING PAPER

H. A. Caesar & Co., *California,* Havre, 2 cs.

COLORED PAPER

J. W. Hampton Jr. & Co., *J. Jadot,* Antwerp, 4 cs.; D. C. Andrews & Co., *Europa,* Bremen, 4 cs.

GUMMED PAPER

Heemsoth Pinkus & Kerner, *Europa,* Bremen, 3 cs.

BOARDING PAPER

G. F. Doherty & Co., *Ile de France,* Havre, 18 pkgs.

ROLL LEAF PAPER

Atlas Roll Leaf Corp., *Gripsholm,* Gothenburg, 1 cs.

PAPER BOARDS

Miller Paper Co., *Gripsholm,* Gothenburg, 24 bls.

PAPER TUBES

———, *Hamburg,* Bremen, 29 cs., 37 ctns.

MISCELLANEOUS PAPER

Chas. Bloom, Inc., *California,* Havre, 1 cs.; Bingham & Co., *Komaki Maru,* Keeling, 2 cs.; Moller Products Corp., *Komaki Maru,* Yokohama, 14 cs.; H. Reeve Angel & Co. Inc., *Komaki Maru,* Yokohama, 8 cs.; Guaranty Trust Co., *Gripsholm,* Gothenburg, 271 rolls; F. L. Kramer & Co., *Gripsholm,* Gothenburg, 285 bls.; E. H. Sargent & Co., *Gripsholm,* Gothenburg, 4 cs.; H. Reeve Angel & Co. Inc., *Gripsholm,* Gothenburg, 160 bls.; The Borregaard Co. Inc., *Gripsholm,* Gothenburg, 225 rolls; Jay Madden Corp., *Hamburg,* Bremen, 27 bbls.

RAGS, BAGGINGS, ETC.

———, *Franconia,* Liverpool, 24 bls. rags; The Barrett Co., *Britannic,* London, 373 bls. rags; ———, *Lossiebank,* Colombo, 41 bls. rags; Bank of N. Y. Trust Co., *Cypria,* Barcelona, 100 bls. bagging, 74 bls. fustians; Bank of N. Y. Trust Co., *Cypria,* Valencia, 140 bls. rags; Chase National Bank, *Cypria,* Valencia 50 bls. rags; Royal Manfg. Co., *J. Jadot,* Antwerp, 25 bls. cotton waste; Irving Trust Co., *J. Jadot,* Antwerp, 64 bls. bagging; ———, *Pennland,* Antwerp, 5 bls. rags, 64 bls. bagging; G. A. Henshaw & Son, *Pennland,* Antwerp, 222 bls. flax waste; G. M. Graves Co. Inc., *Cameronia,* Glasgow, 117 bls. bagging; Amtorg Trading Corp., *Hydraios,* Novorossisk, 284 bls. rags, 1,734 bls. linters; Brandwein, Mazur, *Schodack,* Havre, 179 bls. cotton waste; Loumar Textile By-Products Co., *Schodack,* Havre, 42 bls. rags; J. T. Flannery, *Schodack,* Havre, 165 bls. rags; A. H. Searle, *Schodack,* Dunkirk, 172 bls. rags; J. Eisenberg & Co., *Schodack,* Dunkirk, 19 bls. rags; Royal Manfg. Co., *Schodack,* Dunkirk, 42 bls. cotton waste; New England Waste Co., *Komaki Maru,* Kobe, 400 bls. cotton waste; E. J. Keller Co. Inc., *Excalibur,* ———, 503 bls. rags, 118 bls. bagging; Castle & Overton, Inc., *Excalibur,* Alexandria, 164 bls. bagging; R. Blank, *Excalibur,* Alexandria, 32 bls. rags; D. Galloway, *Black Hawk,* Antwerp, 25 bls. cotton waste; ———, *Black Hawk,* Antwerp, 46 bls. rags; E. Butterworth & Co. Inc.,

Black Hawk, Antwerp, 78 bls. bagging; Irving Trust Co., *Black Hawk,* Antwerp, 134 bls. bagging; Royal Manfg. Co., *Black Hawk,* Antwerp, 130 bls. cotton waste; E. J. Keller Co. Inc., *Black, Hawk,* ———, 83 bls. bagging; A. W. Fenton, Inc., *Washington,* Hamburg, 30 bls. rags; ———, *Cold Harbor,* Manchester, 44 bls. cotton waste; ———, *Cold Harbor,* Liverpool, 17 bls. bagging; Darmstadt Scott & Courtney, *Boschdyk,* Rotterdam, 15 bls. bagging scrap; Birkenstein & Long, Inc., *Nordhavet,* Barcelona, 116 bls. rags; J. G. Vernon & Sons, *Nordhavet,* Barcelona, 162 bls. rags; Katzenstein & Keene, Inc., *Nordhavet,* Barcelona, 223 bls. rags; Manufacturers Trust Co., *Nordhavet,* Barcelona, 49 bls. bagging, 81 bls. old cottons.

GLUE STOCK, ETC.

Darmstadt, Scott & Courtney, *Boschdyk,* Rotterdam, 695 bls. glue stock; N. L. Lederer, *Washington,* Hamburg, 200 bags bone glue; ———, *Hamburg,* Hamburg, 250 bags bone glue.

OLD ROPE

Manufacturers Trust Co., *Pr. Harding,* London, 65 coils; ———, *Cameronia,* Glasgow, 53 coils; W. Steck & Co., *Cavallo,* Newcastle, 55 bls.; Banco Coml. Italiane Trust Co., *Cristobal Colon,* Bilbao, 216 coils; ———, *Cold Harbor,* Belfast, 69 coils; W. Steck & Co., *Boschdyk,* Rotterdam, 87 coils.

CASEIN

———, *Schodack,* Havre, 500 bags; Balfour Guthrie & Co., *Augvald,* Buenos Ayres, 834 bags, 50,0400 kilos.

WOOD PULP

J. Manheimer, *Statendam,* Rotterdam, 25 bls. wood pulp; ———, *Pr. Harding,* Hamburg, 235 bls. wood pulp, 25 tons; M. Sone, *Pr. Harding,* Hamburg, 1,304 bls. wood pulp, 208 tons; Johaneson Wales & Sparre, Inc., *Siljestad,* Gothenburg, 100 bls. sulphate; Pulp Specialties, Inc., *Siljestad,* Gothenburg, 38 bls. sulphate, Perkins Goodwin & Co., *Siljestad,* Gothenburg, 1,016 bls. sulphate; Tradesman's Natl. Bank Trust Co, *Siljestad,* Gefle, 625 bls. sulphate; Pagel Horton & Co. Inc., *Siljestad,* Gefle, 1,665 bls. sulphate; Pagel Horton & Co. Inc., *Siljestad,* Gefle, 2,250 bls. sulphite; Stora Kopparberg Corp., *Siljestad,* Gefle, 265 bls. wood pulp; ———, *Siljestad,* Gefle, 125 bls. sulphite; ———, *Siljestad,* Iggesund, 3,000 bls. sulphite; ———, *Siljestad,* Iggesund, 500 bls. sulphate; Price & Pierce, Ltd., *Siljestad,* Sandviken, 9,600 bls. unbleached kraft, 1,600 tons; E. M. Sargeant Pulp & Chemical Co., *Siljestad,* Sandviken, 300 bls. sulphite; ———, *Siljestad,* Horneborg, 495 bls. chemical pulp; Bulkley Dunton & Co., *Gripsholm,* ———, 200 bls. wood pulp; Perkins Goodwin & Co., *Gripsholm,* Gothenburg, 127 bls. sulphite; D. M. Hicks, Inc., *Gripsholm,* Gothenburg, 30 bls. chemical pulp; ———, *Washington,* Hamburg, 300 bls. wood pulp, 32 tons; Central Hanover Bank Trust Co., *Hamburg,* Hamburg, 700 bls. wood pulp, 108 tons; Bank of N. Y. Trust Co., *Hamburg,* Hamburg, 615 bls. wood pulp, 123 tons; Castle & Overton, Inc., *Hamburg,* Hamburg, 1,925 bls. wood pulp, 385 tons; ———, *Hoegh Transporter,* Trieste, 387 bls. wood pulp; First National Bank of Boston, *Hoegh Transporter,* Trieste, 100 bls. wood pulp.

WOOD PULP BOARDS

Jay Madden Corp., *Pr. Harding,* Hamburg, 71 rolls, 30 tons; G. H. MacFadden & Bros., *Pr. Harding,* Hamburg, 250 bls., 25 tons; H. Fuchs & Son, *Gripsholm,* Gothenburg, 94 crates.

WOOD PULP SHEETS

———, *Hamburg,* Bremen, 110 bls.

NEWARK IMPORTS

WEEK ENDING JULY 25, 1936

H. G. Craig & Co., *Newscarrier,* Donnacona, 331 rolls newsprint.

BOSTON IMPORTS

WEEK ENDING JULY 25, 1936

G. F. Malcolm, Inc., *Franconia,* Liverpool, 12 cs. tissue paper; ———, *Franconia,* Liverpool, 28 bls. rags; Perkins Goodwin & Co., *Siljestad,* Sandviken, 300 bls. sulphite; J. Andersen & Co., *Siljestad,* Sandviken, 1,200 bls. sulphite; The Borregaard Co. Inc., *Siljestad,* Gothenburg, 250 bls. chemical pulp; J. Andersen & Co., *Siljestad,* Gothenburg, 2,250 bls. sulphite; E. J. Keller Co. Inc., *Excalibur,* ———, 139 bls. paper stock; Parsons & Whittemore, Inc., *Frankfurt,* ———, 625 bls. wood pulp; Bulkley Dunton & Co., *Fechenheim,* ———, 1,450 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING JULY 25, 1936

Chase National Bank, *Cypria,* Barcelona, 256 bls. glue stock; E. J. Keller Co. Inc., *Cypria,* ———, 158 bls. rags; Johaneson Wales & Sparre, Inc., *Siljestad,* Gothenburg, 125 bls. sulphate; Whiting & Patterson Co. Inc., *Siljestad,* Gothenburg, 9 rolls paper; The Borregaard Co. Inc., *Siljestad,* Gothenburg, 130 bls., 37 rolls paper; Perkins Goodwin & Co., *Siljestad,* Gothenburg, 386 bls. sulphate; Gottesman & Co. Inc., *Siljestad,* Gothenburg, 630 bls. chemical pulp; Gottesman & Co. Inc., *Siljestad,* Gothenburg, 795 bls. sulphite; Gottesman & Co. Inc., *Siljestad,* Gefle, 2,775 bls. sulphite; Pagel Horton & Co. Inc., *Siljestad,* Gefle, 1,000 bls. sulphite; Stora Kopparberg Corp., *Siljestad,* Gefle, 795 bls. wood pulp; Gottesman & Co. Inc., *Siljestad,* Iggesund, 875 bls. sulphite; Price & Pierce, Ltd., *Siljestad,* Sandviken, 600 bls. mechanical pulp; Philadelphia Inquirer, *Siljestad,* Norrkoeping, 498 rolls newsprint; Guaranty Trust Co., *Siljestad,* Norrkoeping, 627 rolls, 67 bls. paper; National Vulcanized Fibre Co., *Schodack,* Havre, 32 bls. rags; Castle & Overton, Inc., *Schodack,* Havre, 384 bls. rags; Union Waste Co., *Schodack,* Dunkirk, 28 bls. cotton waste; Darmstadt Scott & Courtney, *Schodack,* Dunkirk, 126 bls. cotton waste; ———, *Cold Harbor,* Liverpool, 299 bls. bagging; Chase National Bank, *Cold Harbor,* Glasgow, 55 bls. rags; R. Wilson Paper Corp., *Cold Harbor,* Glasgow, 10 rolls printing paper.

BALTIMORE IMPORTS

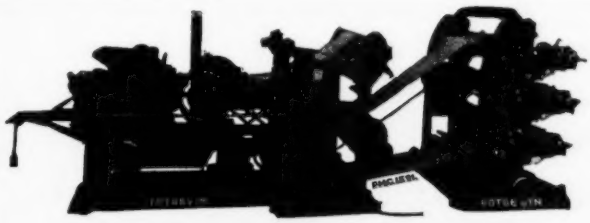
WEEK ENDING JULY 25, 1936

———, *Cold Harbor,* Manchester, 11 bls. rags; Bulkley Dunton & Co., *Ditmar Koel,* ———, 6,775 bls. wood pulp; Bulkley Dunton & Co., *Tampa,* ———, 875 bls. wood pulp; Parsons & Whittemore, Inc., *City of Hamburg,* ———, 1,370 bls. wood pulp; Price & Pierce, Ltd., *Fechenheim,* ———, 400 tons unbleached kraft pulp; Price & Pierce, Ltd., *Fechenheim,* ———, 325 tons unbleached sulphite; Gottesman & Co. Inc., *Lagaholm,* Sweden, 600 bls. wood pulp; Gottesman & Co. Inc., *Lagaholm,* Finland, 250 bls. wood pulp.

MONTREAL IMPORTS

WEEK ENDING JULY 25, 1936

Price & Pierce, Ltd., *Loke,* ———, 300 tons unbleached kraft pulp; Price & Pierce, Ltd., *Loke,* ———, 400 tons unbleached sulphite; Price & Pierce, Ltd., *Tyrifjord,* ———, 700 tons unbleached kraft pulp; Price & Pierce, Ltd., *Tyrifjord,* ———, 250 tons unbleached sulphite; Pagel Horton & Co. Inc., *Tyrifjord,* Sweden, 4,150 bls. sulphite; Pagel Horton & Co. Inc., *Loke,* Sweden, 1,800 bls. sulphite; Pagel Horton & Co. Inc., *Drammensfjord,* Sweden, 7,150 bls. sulphite, 2,500 bls. sulphate; Pagel Horton & Co. Inc., *Rydboholm,* Sweden, 17,646 bls. sulphite, 3,972 bls. sulphate; Gottesman & Co. Inc., *Rydboholm,* Sweden, 3,150 bls. wood pulp; Gottesman & Co., Inc., *Tyrifjord,* Sweden, 13,500 bls. wood pulp.



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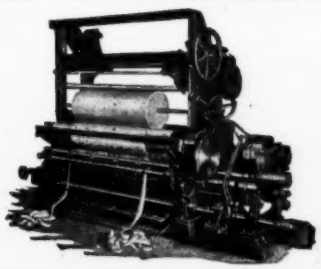

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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, July 29, 1936.

Business in the local paper market is fairly satisfactory for the time of year and the usual midsummer slump is less in evidence. Sales forces of the leading paper organizations are preparing for an active campaign in the closing months of the year. Prices are generally steady and unchanged.

The newsprint paper market is exhibiting a stronger undertone. Advertising lineage and circulations of the leading newspapers are running well ahead of last year's record and the outlook for the immediate future is quite encouraging. The price situation is improving and there is much talk of higher quotations for the coming year.

Demand for the various grades of fine paper is well sustained. Orders for writing paper, in particular, are heavier than a year ago and a 15 per cent increase is confidently anticipated for the entire year compared with 1935. Tissues are moving in good volume. The coarse paper market is displaying strength.

Mechanical Pulp

The position of the ground wood pulp market is practically unchanged. Manufacturing operations in the United States, Canada and abroad are being maintained in sufficient volume to take care of current requirements. Supplies are moving into consumption regularly. Prices are holding to schedule, in most instances.

Chemical Pulp

Steadiness prevails in the chemical pulp market. Demand for the various domestic and foreign grades is well sustained. Offerings, however, are decidedly limited, especially for bleached sulphite and kraft pulps. Other grades of chemical pulp are steady. Quotations continue decidedly firm.

Old Rope and Bagging

The old rope market is showing signs of improvement. Paper mill demand for old manila rope is slightly better. Mixed strings are arousing more interest than of late. Old rope prices remain unchanged. No radical changes have transpired in the bagging market. The price situation is irregular.

Rags

Business in the domestic rag market is only moderately active. Demand for new and old cotton rags is mainly along routine lines. Roofing grades are rather quiet at present. Quotations are generally holding to former levels. The imported rag market is dull, with prices on most of the grades nominal.

Waste Paper

The local paper stock market is stronger. Board mill interest in the lower grades is more in evidence than of late and quotations on strictly folded news and No. 1 mixed paper are firmer. The higher grades of waste paper are fairly steady, although the prevailing demand is light. Book stock continues listless.

Twine

Business in the local twine market is fairly active. Demand for the various varieties is reported better than in the corresponding period last year. Inquiries for future needs are fairly numerous, and the outlook for the future is promising. Prices are holding to formerly quoted levels.

New Line of Bristol Controllers

A new line of controllers for temperature, time-temperature, flow, liquid level, pressure, time-pressure, and humidity is announced by the Bristol Company. These controllers, known as Master Free-Vane Controllers, are offered primarily for applications where a greatly reduced sensitivity (wide throttling range) is required and the load conditions fluctuate over a wide range.

The Master Free-Vane Controller is a pneumatic-type controller operating on Bristol's Free-Vane principle of control. It is similar in many respects to the new Ampliset Controller, an instrument equipped with a sensitivity adjustment, announced by this company recently.

In the Master Free-Vane Controller the basic Free-Vane System is equipped with a sensitivity adjustment, an automatic reset, and accessory features which minimize hunting; prevent departure from the control setting; make it possible to reach a new control setting without overshooting; make it possible to adjust the anticipatory effect to fit the process lag; make it possible to adjust the resetting mechanism to function in an amount proportional to the rate of change in the process.

The Master Free-Vane Controller is offered primarily to take care of more severe conditions encountered in processes, such as sudden load changes, over-shooting, etc. It is designed to automatically compensate for each of the disturbing elements in industrial processes that, from time to time, have a tendency to upset the true function of the control system. It also makes it possible to obtain precision control on extremely difficult applications without assistance from the operator. Moreover, it is a self-contained instrument of quite simple design with all parts contained in one case.

Robert Gair Reports Profit

Robert Gair Company, Inc., and subsidiary companies report for the quarter ended June 30, 1936, as follows:

Profit was $216,069 after depreciation, interest on bonds of subsidiary company and dividend on preferred stock of subsidiary, but before providing for interest on income notes and for income taxes of about $63,000. Profit in the June quarter last year was $285,508 before income taxes and interest on income notes. The figures are subject to year-end adjustments.

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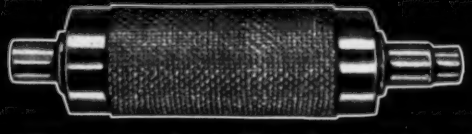

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Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, July 29, 1936.

BLANC FIXE.—Steadiness prevails in the blanc fixe market. Prices are holding to formerly quoted levels, in most instances. The pulp is quoted at $42.50 to $45 per ton, in bulk; while the powder is selling at 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The position of the bleaching powder market is practically unchanged. Contract shipments are moving regularly. Prices remain steady and unaltered. Bleaching powder is quoted at $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues firm. Domestic standard ground is quoted at 16½ and finely ground at 17 cents; while French and Argentine standard ground are selling at 17 and finely ground at 17½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Business in the caustic soda market is fairly active. The contract movement is well up to average. Solid caustic soda is quoted at $2.55 to $2.60; while the flake and ground are selling at $2.95 to $3.00 per 100 pounds, in drums, at works.

CHINA CLAY.—The china clay market is exhibiting a fairly strong undertone. Prices are steady. Imported china clay is quoted at $12.50 to $21 per ton, ship side; while domestic paper making clay is selling at $6.50 to $12 per ton, at mine.

CHLORINE.—Conditions in the chlorine market are satisfactory. Demand from the paper mills is fairly brisk. Prices are holding to schedule and reports of shading are infrequent. Chlorine is quoted at $2.15 to $2.55 per 100 pounds, in tank cars, at works.

ROSIN.—The rosin market is very firm. Paper making gum rosin is now quoted at $5.90 and wood rosin at $5.35 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.92 per 100 pounds, in tank cars, at works.

SALT CAKE.—Paper mill demand for salt cake is well sustained. The contract movement is normal. Salt cake is still quoted at $12 to $13; chrome salt cake at $11 to $12 per ton, at works; while imported salt cake is selling at $12 to $13 per ton, ship side.

SODA ASH.—The soda ash market is displaying strength. Shipments against contract are moving in good volume for the time of the year. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH.—The starch market continues to show signs of improvement. Paper mill demand is active. Prices are still rising. Special paper making starch is now quoted at $3.55 per 100 pounds, in bags; and at $3.82 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Demand for sulphate of alumina is persistent. Supplies are moving into consumption in good volume. Prices remain unchanged. Commercial grades are quoted at $1.35 to $1.60; and iron free at $2 to $2.25 per 100 pounds, in bags, at works.

SULPHUR.—The sulphur market continues steady. Yearly contracts are quoted at $18 per ton, in bulk, on orders of 1,000 tons or over and $20 on smaller quantities. On spot and nearby car loads the quotation is $21 per ton. All quotations are in car lots, at works.

TALC.—No radical changes have transpired in the talc market of late. The prevailing demand is mainly routine. Domestic talc is quoted at $16 to $18 per ton, at eastern mines; while imported talc is selling at $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.50 @	8.50
No. 2 Sulphite	6.50 @	7.50
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

Book, B Grade, Cased		
S. & S. C.	5.85 @	6.60
S. & S. C. Litho.	6.10 @	6.85
M. F.	5.60 @	6.35
No. 4 Grade		
Coated and Enamel	6.80 @	7.65
Coated Litho	6.80 @	7.65
Tissues—Per Ream—		
White No. 1	.82½ @	—
White No. 1 M. G.	.77½ @	—
White No. 1½	.62½ @	—
White No. 2	.60 @	—
Anti-Tarnish M. G.	.67½ @	—
Colored	.80 @	—
Kraft	.67½ @	—
Manila	.60 @	—
Unbleached Toilet	2.60 @	3.30
Bleached Toilet	3.94 @	5.26
Paper Towels—		
Unbleached	2.10 @	3.35
Bleached	3.30 @	3.70
Manila—		
No. 1 Jute	9.00 @	9.25
No. 2 Jute	7.75 @	8.50
No. 1 Wood	4.00 @	5.25
No. 2 Wood	3.50 @	4.00
Fibre Papers—		
No. 1 Fibre	4.25 @	5.50
No. 2 Fibre	4.00 @	4.75

(Delivered New York)

News, per ton—		
Roll, contract	41.00 @	—
Sheets	46.00 @	—
Kraft—		
No. 1 Northern	4.25 @	4.75
Standard	4.12½ @	—
Southern	4.00 @	—
Boards—per ton—		
News	32.50 @	35.00
Chip	32.50 @	35.00
Sgl. Mla. LL. Chip	45.00 @	47.50
Jute Lined Chip	42.50 @	45.00
Kraft Liners	60.00 @	62.50
White Pat. Coated	57.50 @	60.00
Binders Boards	67.00 @	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	24.00 @	25.00
Dry	24.00 @	25.00

(Delivered)

No. 1 Domestic and Canadian	27.00 @	28.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—		
Division 1	2.70 @	3.30
Division 2	2.65 @	2.75
Division 3	2.60 @	2.70
Prime Qualities—		
Class 1. All Prime Easy Bleaching	2.05 @	2.10
Other Than Easy Bleaching—		
Class 2. Higher than Standard	2.00 @	2.05
Class 3, Standard	1.95 @	2.00
Class 4. Lower than Standard	1.90 @	1.95

(On Dock, Atlantic Ports)

Kraft Bleached	3.00 @	3.25
Kraft No. 1	1.85 @	2.10
Kraft No. 2	1.70 @	1.85

(F. o. b. Pulp Mill)

Kraft Domestic	1.80 @	2.00

(Delivered)

Soda Bleached	2.60 @	—

* Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	7.50 @	7.75
Silesias No. 1	5.50 @	5.75
New Unbleached	8.25 @	8.50
New Soft Blacks	3.75 @	4.00
Blue Overall	6.50 @	6.75
Fancy	3.00 @	3.25
Washables	2.25 @	2.50
Mixed Khaki Cuttings	3.50 @	3.75
O. D. Khaki Cuttings	4.25 @	4.50
Men's Corduroy	2.00 @	2.25
New Mixed Blacks	2.75 @	3.00

Old Rags

White, No. 1—		
Repacked	3.25 @	3.50
Miscellaneous	2.75 @	3.00
White, No. 2—		
Repacked	2.25 @	2.50
Miscellaneous	1.75 @	2.00
Thirds and Blues—		
Repacked	2.00 @	2.25
Miscellaneous	1.90 @	2.00
Roofing Rags—		
No. 1	1.75 @	1.80
No. 2	1.15 @	1.25
No. 3 (bagging)	1.10 @	1.15
No. 4	1.10 @	1.15
No. 5A	.80 @	.90

Foreign Rags

New Rags

New Dark Cuttings	2.25 @	2.50
New Mixed Cuttings	2.00 @	2.25
New Light Silesias	4.50 @	5.00
Light Flannelettes	4.50 @	5.00
New White Cuttings	7.00 @	7.50
New Light Oxfords	4.00 @	4.50
New Light Prints	3.00 @	3.25

Old Rags

No. 1 White Linens	7.50 @	8.00
No. 2 White Linens	6.50 @	7.00
No. 3 White Linens	4.50 @	5.00
No. 4 White Linens	2.25 @	2.50
No. 1 White Cotton	4.25 @	4.75
No. 2 White Cotton	3.25 @	3.75
No. 3 White Cotton	2.50 @	2.75
No. 4 White Cotton	1.90 @	2.15
Extra Light Prints	2.00 @	2.25
Ord. Light Prints	1.75 @	1.85
Med. Light Prints	1.55 @	1.65
Dutch Blue Cottons	2.25 @	2.50
French Blue Linens	3.50 @	4.00
German Blue Linens	2.50 @	2.75
German Blue Cottons	2.00 @	2.25
Checks and Blues	2.00 @	2.25
Linsey Garments	2.15 @	2.25
Dark Cottons	1.90 @	2.10
Old Shopperies	1.75 @	2.00
New Shopperies	1.75 @	2.00
French Blues	2.25 @	2.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	2.10 @	2.15
Domestic	1.75 @	1.85
Wool Tares, light	1.50 @	1.75
Wool Tares, heavy	1.85 @	2.05
Bright Bagging	1.70 @	1.75
Manila Rope—		
Foreign	2.40 @	2.60
Domestic	2.25 @	2.50
Mixed Strings	1.10 @	1.15
New Burlap Cut	2.75 @	3.00
Hessian Jute Threads—		
Foreign	3.00 @	3.25
Domestic	2.80 @	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
White Envelope Cuttings	2.55 @	2.65
Ordinary Hard White No. 1	2.25 @	2.35
Hard White No. 2	2.10 @	2.20
Soft White No. 1	1.95 @	2.05
Flat Stock—		
Stitchless	.65 @	.75
Over issue Mag	.65 @	.75
Solid Flat Book	.55 @	.60
Crumpled No. 1	.35 @	.40
Solid Book Ledger	1.50 @	1.65
Ledger Stock	.85 @	.90
New B. B. Chips	.30 @	.35
Manilas—		
New Env. Cut	1.75 @	1.85
New Cuttings	1.35 @	1.45
Bogus Wrapper	.40 @	.50
Old Kraft Machine— Compressed bales	1.05 @	1.30
News—		
No. 1 White News	1.15 @	1.25
Strictly Overissue	.50 @	.60
Strictly Folded	.35 @	.40
No. 1 Mixed Paper	.30 @	.35

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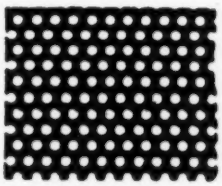

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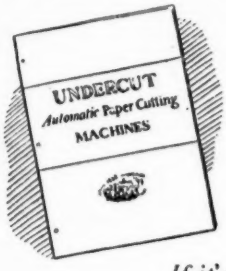

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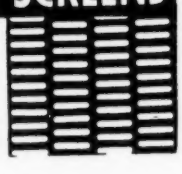

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Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—			
India	.13¾	@	.15¾
Belg. White Hemp	.14¼	@	.17¾
India Compress	.13¾	@	.14¼
Fine Polished—			
Fine India	.21½	@	.23½
Special	.19½	@	.21½
Unpolished—			
Box	.12	@	.12½
Paper Makers	.09	@	.13½
Tube Rope	.10	@	.15½
Wall Paper	.11	@	.14½
Wrapping	.15½	@	.21
Special	.15	@	.15½
Soft Fiber Rope	.12½	@	.12¾
(Hard Fibre)			
Bond	.09½	@	.18
Anchor	.09	@	.10½
Manila	.21	@	.28

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.40
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.07¾
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¼	@	.06¾
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¾	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¾	@	.06¼
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	42.00	@	—
Sheets, open	47.00	@	—
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.	1.70		
100 Test, per 1000 sq. ft.	1.85		

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.60	@	.70
Solid Books	.50	@	.60
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45
Old Newspapers—			
No. 1 Folded News	.42½	@	.45
No. 1 Mixed Paper	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

Rag Content Bond & Ledgers— Delivered Zone 1	Bonds		Ledgers
100% Rag Ext. No. 1	.36		.37
100% Rag	.28		.29
75% Rag	.21		.22
65% Rag	.18		.19
50% Rag	.15		.16
25% Rag	.12½		.13½

Sulphite Bond & Ledgers— Delivered Zone 1	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, M. F.	5.00	@	—
Book, S. S. & C.	5.25	@	—
Book, Coated	6.15	@	—
Coated Lithograph	6.15	@	—
No. 1 Jute Manila	10.50	@	—
Manila Sul., No. 1	6.75	@	—
Manila No. 2	4.25	@	—
No. 1 Kraft	6.00	@	—
Southern Kraft	5.00	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.08	@	.08½
New White, No. 2	.04½	@	.05
Light Silesias	.05½		—
Silesias, No. 1	.04½	@	.05
Black Silesias, soft	.03½	@	.04
New Unbleached	.06	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.06	@	.06½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.01¾	@	.02¼
Fancy	.03	@	—
New Black Soft	.04	@	.04½
New Light Seconds	.03½	@	.04
New Dark Seconds	1.75	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04
Corduroy	.02	@	.02¼
New Canvas	.04	@	.04½
New Black Mixed	.02	@	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	2.00	@	—
Repacked	2.25	@	2.50
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	2.20	@	2.25
Domestic No. 1	1.50	@	—
Domestic No. 2	1.40	@	—
Roofing bagging	1.10	@	—

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	2.00	@	2.25
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.00	@	2.50
No. 2	.90	@	1.00
Wool Tares, heavy	3.00	@	3.25
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.40
No. 2 Hard White	2.10	@	2.20
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.40	@	1.45
No. 1 Mixed	—	@	.85
Solid Ledger Stock	1.50	@	1.60
Ledger Stock, white	1.15	@	1.20
Ledger Stock, colored	.85	@	.90
No. 1 Books, heavy	.65	@	.70
Manila Cuttings	1.50	@	1.60
Print Manila	.50	@	.60
Container Manila	.50	@	.60
Kraft Paper	1.10	@	1.20
No. 1 Mixed Paper	.35	@	.40
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.60	@	.65
Overissue News	.60	@	—
Old Newspapers	.40	@	—

BOSTON

Paper

Rag Content Bond & Ledgers— Delivered Zone 1	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers— Delivered Zone 1	Bonds	Ledgers
No. 1 Sulphite	7.50	8.50
No. 2 Sulphite	6.50	7.50
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¼
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¼	@	—
No. 2 Kraft	.04½	@	—

(Delivered New England points)

Southern Kraft	.04	@	—
News Print Rolls	39.50	@	—
Straw Board, rolls	.009	@	35.00
Filled News Board	40.00	@	45.00
Chip Board	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	55.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.10
No. 1 Soft White	1.75	@	1.85
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.50	@	1.75
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.60	@	.70
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.50	@	1.60
No. 1 Old Manila	.60	@	.65
White Blank News	1.10	@	1.15
No. 1 Kraft	1.05	@	1.12½
Mixed Papers	.30	@	—
Print Manila	.47½	@	.50
Container Manilas	.27½	@	—
Old Newspapers	.30	@	—
Overissue News	—	@	.40
Box Board Chips	—	@	.25
Corrugated Boxes	.35	@	.37½
Kraft corrugated boxes	.95	@	1.00
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.35	@	2.45
Domestic	2.25	@	—
Transmission Rope	1.20	@	1.30
Jute Rope	1.90	@	2.10
Jute Carpet Threads	1.00	@	1.10
Gunny No. 1—			
Foreign	1.90	@	2.00
Domestic	1.80	@	1.90
Bleachery Burlap	4.25	@	4.50
Scrap Burlap—			
Foreign	1.90	@	2.00
Domestic	1.60	@	1.75
Scrap Sisal	1.90	@	2.00
Scrap Sisal for Shredding	2.10	@	2.25
Wool Tares, heavy	1.90	@	2.00
New Burlap Cuttings	2.00	@	2.25
Australian Wool Pouches	2.25	@	2.35
Heavy Baling Bagging	1.75	@	2.10
Paper Mill Bagging	1.65	@	1.70
Bagging No. 2	1.10	@	1.25

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1	.07	@	.07½
New White No. 2	.04	@	.04¼
Silesias No. 1	.05	@	.05½
New Black Silesias	.03½	@	.04¼
Soft Unbleached	.07¼	@	.07¾
Blue Cheviot	5.50	@	6.00
Fancy	.02½	@	.02¾
Washable	.0165	@	.0170
Cottons—According to grades—			
Blue Overalls	5.00	@	5.50
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¼
O. D. Khaki	.03¾	@	.04¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.75	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	3.90	@	4.00
Roofing Stock—			
No. 1	1.30	@	1.40
No. 2	1.20	@	1.25
No. 3	—	@	1.15

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.50	@	1.70
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.75	@	1.90
Old Linsey Garments	1.75	@	2.00
New Silesias	5.00	@	5.75

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.11	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.12	@	—
No. 2 Colored	.09	@	—
Ledgers			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.50	@	—
No. 2 M. F. (Carloads)	6.00	@	—
No. 3 M. F. (Carloads)	6.00	@	—
No. 1 S. C. (Carloads)	7.00	@	—
No. 2 S. C. (Carloads)	6.50	@	—
No. 3 S. C. (Carloads)	6.50	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	4.80	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	40.50	@	—
Sheets	45.00	@	—

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	59.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.40
Printed Manilas	.50	@	—
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.55	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.07½	@	.07¾
Fancy Shirt Cuttings	.02½	@	.03